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**PAYLOAD AND TRAJECTORY DATA  
FOR GSFC NIKE APACHE FIRINGS  
JANUARY-JUNE 1965  
TRACKED BY RADAR**

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**GODDARD SPACE FLIGHT CENTER**  
**GREENBELT, MARYLAND**

3 PAYLOAD AND TRAJECTORY DATA  
FOR GSFC NIKE APACHE FIRINGS  
JANUARY - JUNE 1965  
TRACKED BY RADAR 6

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February 1967

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ABBREVIATIONS AND SYMBOLS  
FOR SOUNDING ROCKET DOCUMENTS

Abbreviations:

AFCRL	- Air Force Cambridge Research Laboratory, Bedford, Mass.
AIL	- Airborne Instruments Laboratory, Melville, Long Island, N.Y.
AS&E	- American Science and Engineering, Inc., Cambridge, Mass.
BRL	- Ballistic Research Laboratories, Aberdeen, Md.
BuStds	- National Bureau of Standards, Boulder, Colo.
CRPL	- Central Radio Propagation Laboratory, National Bureau of Standards, Boulder, Colo.
DRTE	- (Canadian) Defense Research Telecommunications Establishment, Ottawa, Canada
Ga. Tech.	- Georgia Institute of Technology, Atlanta, Ga.
GCA	- Geophysics Corporation of America, Bedford, Mass.
Harvard	- Harvard College, Cambridge, Mass.
JHU	- Johns Hopkins University, Baltimore, Md.
JPL	- Jet Propulsion Laboratory, Pasadena, Calif.
LaRC	- NASA, Langley Research Center, Hampton, Va.
LeRC	- NASA, Lewis Research Center, Cleveland, Ohio
Lockheed	- Lockheed Missiles and Space Division, Palo Alto, Calif.
NCAR	- National Center for Atmospheric Research, Boulder, Colo.
NRL	- Naval Research Laboratory, Washington, D. C.
NYU	- New York University, New York, N.Y.
Rice	- Rice University, Houston, Texas
SCAS	- Southwest Center for Advanced Studies, Dallas, Texas
Stanford	- Stanford Research Institute, Menlo Park, Calif.
U. Colo.	- University of Colorado, Boulder, Colo.
U. Ill.	- University of Illinois, Urbana, Ill.

U. Mich.	- University of Michigan, Ann Arbor, Mich.
U. Minn.	- University of Minnesota, Minneapolis, Minn.
UNH	- University of New Hampshire, Durham, N.H.
U. Wisc.	- University of Wisconsin, Madison, Wisc.
Varian	- Varian Associates, Palo Alto, Calif.

Firing Sites:

ARG	- Chamical, Argentina
ASC	- Ascension Island
AUS	- Woomera, Australia
BRZ	- Natal, Brazil
EGL	- Eglin Air Force Base, Florida
FC	- Fort Churchill, Canada
IND	- Thumba, India
Italy	- Sardinia, Italy
NOR	- Andoya, Norway
NZ	- Karikari, New Zealand
PB	- Point Barrow, Alaska
PMR	- Pacific Missile Range
PAK	- Karachi, Pakistan
SWE	- Kronogard, Sweden
SUR	- Coronie, Surinam
WI	- Wallops Island, Virginia
WIMR	- Wallops Island Mobile Range, W. I., Virginia
WS	- White Sands Missile Range, New Mexico

## Numbering System:

NASA	1.—Aerobee 100	10.—Nike Cajun
	2.—Arcon	11.—Argo D-8
	3.—Nike Asp	12.—Special projects
	4.—Aerobee 150, 150 A	14.—Nike Apache
	5.—Iris	15.—Arcas
	6.—Aerobee 300	16.—Astrobee 1500
	7.—Argo E-5	17.—Aerobee 350
	8.—Argo D-4	18.—Nike Tomahawk
	9.—Skylark	

Numbers following the decimal point indicate chronological order of assignment to Goddard missions.

## Identifying Letters:

The letters which follow each rocket number identify —

- (1) the instrumenting agency, and
- (2) the experiment, according to the following list:

### 1. Agency

- G - Goddard
- N - Other NASA centers
- U - College or university
- D - Department of Defense
- A - Other government agency
- C - Industrial corporations
- I - International

### 2. Experiment

- A - Aeronomy
- E - Energetic particles and fields
- I - Ionospheric physics
- S - Solar physics
- G - Galactic astronomy
- R - Radio astronomy
- B - Biological
- P - Special projects
- T - Test and support
- M - Meteorology



PAYLOAD AND TRAJECTORY DATA FOR  
GSFC NIKE APACHE FIRINGS JANUARY - JUNE 1965  
TRACKED BY RADAR

Howard L. Galloway, Jr.  
Sounding Rocket Branch  
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and  
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Fairchild Hiller Corporation

The Nike Apache, a two-stage solid-propellant unguided sounding rocket, is stabilized by four fins (on each of the two stages) arranged in a cruciform configuration.

A conical transition section bolted to the first stage slip-fits into the nozzle of the second stage. At first-stage burnout, differential drag forces separate the stages as no mechanical restraint in the axial direction exists between the second stage and the transition assembly. Second-stage ignition is normally delayed for 16.5 seconds after first-stage burnout in order to reduce aerodynamic heating and drag in the low-altitude high-density region.

Of 65 Nike Apaches fired from January to June 1965 by Goddard Space Flight Center, 47 were tracked by radar. Table 1 lists payload and launch data for these rockets.

Figure 1 shows the four standard drag configurations of Nike Apaches used by GSFC. Many payloads, however, do not conform to these standards. Figures 2 through 325 consist of a photograph or sketch of the payload configuration of each rocket tracked by radar, followed by its radar plots. Neither photographs nor sketches are available for rockets 14.98 UA, 14.99 UA, and 14.100 UA, which were similar to rockets flown with a drag case 3 configuration.

Table 1

## Nike Apache Rockets Fired January - June 1965 Tracked By Radar

ROCKET NUMBER	LAUNCH DATE	LAUNCH SITE	PAYLOAD WEIGHT (lb)	PAYLOAD LENGTH (in.)	PREDICTED ELEVATION (degrees)	LAUNCH ANGLE AZIMUTH (degrees)	RADAR	SCIENTIST	EXPERIMENT
GSFC	WI								
14.07 UE	KS2-1830	12 Mar 65	WIMR	65	80.25	85	270	MPS-19; Vacuum Inserted	UNH Opp Magnetic fields
14.25 UA	GS2-1822	15 Apr 65	WIMR	62	74.2	85	210	MPS-19; Vacuum Inserted	U. Mich. W. Smith Atmosphere structure
14.26 UA	GS2-1823	6 Apr 65	WIMR	62	74.2	85	200	MPS-19; Vacuum Inserted	U. Mich. W. Smith Atmosphere structure
14.27 UA	GS2-1824	13 Apr 65	WIMR	62	74.2	85	180	MPS-19; Vacuum Inserted	U. Mich. W. Smith Atmosphere structure
14.61 UE	G2-2022	3 Feb 65	WI	80	79 7/8	80	105	FPS-16; FPQ-6	UNH Schardt Energetic particles
14.62 UA	G2-1185	18 Mar 65	WI	63	65	80	100	MOD II with Film; FPQ-6	SCAS Horowitz Composition
14.64 UA	GS2-1847	8 Mar 65	WIMR	62	74.2	85	270	MPS-19; Film Data; Vacuum Data	U. Mich. W. Smith Atmosphere structure
14.65 UA	GS2-1848	9 Mar 65	WIMR	62	74.2	82.4	270	MPS-19; Vacuum Inserted	U. Mich. W. Smith Atmosphere structure
14.66 UA	GS2-1849	4 Apr 65	WIMR	62	74.2	85	270	MPS-19; Vacuum Inserted	U. Mich. W. Smith Atmosphere structure
14.67 UA	GS2-1850	13 Apr 65	WIMR	62	74.2	85	150	MPS-19; Vacuum Inserted	U. Mich. W. Smith Atmosphere structure
14.71 CM	G2-2262	23 Jun 65	WI	66.5	59	80	140	FPS-16; FPQ-6	GCA W. Smith Luminescent cloud
14.72 CM	G2-2263	23 Jun 65	WI	66.5	59	80	100	FPS-16; Spandax	GCA W. Smith Luminescent cloud
14.73 CM	G2-2264	23 Jun 65	WI	75.5	62	80	140	FPS-16; FPQ-6	GCA W. Smith Luminescent cloud
14.74 CM	G2-2265	23 Jun 65	WI	59.5	62 7/8	80	105	FPS-16	GCA W. Smith Luminescent cloud
14.83 UE	KS2-1831	10 Mar 65	WIMR	65	80.25	85	270	MPS-19; Vacuum Inserted	UNH Opp Magnetic fields
14.84 UE	KS2-1832	12 Mar 65	WIMR	65	80.25	85	270	MPS-19; Vacuum Inserted	UNH Opp Magnetic fields
14.85 UE	KS2-1833	9 Mar 65	WIMR	65	80.25	85	270	MPS-19; Vacuum Inserted	UNH Opp Magnetic fields
14.98 UA	KS2-1844	11 Mar 65	WIMR	70	71.25	85	270	MPS-19; Vacuum Inserted	U. Mich. Dubin Composition
14.99 UA	KS2-1845	11 Mar 65	WIMR	70	71.25	85	310	MPS-19; Vacuum Inserted	U. Mich. Dubin Composition
14.100 UA	KS2-1803	15 Apr 65	WIMR	70	71.25	85	210	MPS-19; Vacuum Inserted	U. Mich. Dubin Composition
14.132 NA	G2-2194	1 Apr 65	WI	87	73.5	80	95	FPS-16; FPQ-6; Spandax	LeRC Potter Airglow
14.142 NA	G2-1186	7 Jan 65	WI	87	73.5	80	95	FPS-16; FPQ-6; Spandax	LeRC Potter Airglow
14.160 GE	GS2-1914	8 Mar 65	WIMR	60	80.25	85	270	MPS-19 Vacuum Inserted	T. N. Davis Magnetic fields

Table 1 (Continued)  
Nike Apache Rockets Fired January - June 1965 Tracked By Radar

14.171 GE	GS2-1806	16 Mar 65	WIMR	60	80.25	85	285	MPS-19; Vacuum Inserted	T. N. Davis	Geomagnetism
14.172 GE	GS2-1807	18 Mar 65	WIMR	60	80.25	85	270	MPS-19; Vacuum Inserted	T. N. Davis	Geomagnetism
14.173 GE	GS2-1808	26 Mar 65	WIMR	60	80.25	85	280	MPS-19; Vacuum Inserted	T. N. Davis	Geomagnetism
14.174 GE	GS2-1809	24 Mar 65	WIMR	60	80.25	85	265	MPS-19; Vacuum Inserted	T. N. Davis	Geomagnetism
14.175 GE	GS2-1810	27 Mar 65	WIMR	60	80.25	85	300	MPS-19; Vacuum Inserted	T. N. Davis	Geomagnetism
14.176 GE	GS2-1805	18 Mar 65	WIMR	60	80.25	85	270	MPS-19; Vacuum Inserted	T. N. Davis	Geomagnetism
14.177 GI	GS2-1812	16 Mar 65	WIMR	55	71.75	85	285	MPS-19; Vacuum Inserted	Aikin, Blumie	Ionospheres
14.178 GI	GS2-1813	18 Mar 65	WIMR	55	71.75	85	270	MPS-19; Film Data	Aikin, Blumie	Ionospheres
14.179 GI	GS2-1814	18 Mar 65	WIMR	55	71.75	85	270	MPS-19; Vacuum Inserted	Aikin, Blumie	Ionospheres
14.180 GI	GS2-1815	24 Mar 65	WIMR	55	71.75	85	265	MPS-19; Vacuum Inserted	Aikin, Blumie	Ionospheres
14.181 GI	GS2-1816	26 Mar 65	WIMR	55	71.75	85	280	MPS-19; Vacuum Inserted	Aikin, Blumie	Ionospheres
14.182 GI	GS2-1811	27 Mar 65	WIMR	55	71.75	85	300	MPS-19; Vacuum Inserted	Aikin, Blumie	Ionospheres
14.184 UE	KS2-1835	5 Apr 65	WIMR	65	80.25	85	210	MPS-19	UNH Schardt	Energetic particles
14.185 UE	KS2-1836	2 Apr 65	WIMR	65	80.25	85	210	MPS-19; Vacuum Inserted	UNH Schardt	Energetic particles
14.186 UE	KS2-1837	13 Apr 65	WIMR	65	80.3	85	360	MPS-19; Vacuum Inserted	UNH Schardt	Energetic particles
14.201 CA	G2-2306	23 Jun 65	WI	69.5	73	79.8	96.1	FPS-16; FPQ-6	GCA W. Smith	Ionospheres; Luminescent Clouds
14.215 AI	G2-2261	18 Jun 65	WI	42.5	78.25	77.3	105	FPQ-6	BuSds Schmerling	Ionospheres
14.228 UI	KS2-1817	20 Mar 65	WIMR	55	67	83	280	MPS-19; Vacuum Inserted	U. Ill. Schmerling	Ionospheres
14.229 UI	KS2-1818	23 Mar 65	WIMR	60	76.50	83	280	MPS-19; Vacuum Inserted	U. Ill. Schmerling	Ionospheres
14.230 UI	KS2-1819	5 Apr 65	WIMR	55	67	83	278	MPS-19; Vacuum Inserted	U. Ill. Schmerling	Ionospheres
14.231 UI	KS2-1820	9 Apr 65	WIMR	55	67	84	0	MPS-19; Vacuum Inserted	U. Ill. Schmerling	Ionospheres
14.232 UI	KS2-1821	12 Apr 65	WIMR	55	67	84	180	MPS-19; Vacuum Inserted	U. Ill. Schmerling	Ionospheres
14.245 UI	G2-2259	14 Jun 65	WI	50	65 7/8	80	100	FPS-16; FPQ-6	U. Ill. Schmerling	Ionospheres
14.246 UI	G2-2260	17 Jun 65	WI	50	65 7/8	80	100	FPS-16; FPQ-6	U. Ill. Schmerling	Ionospheres

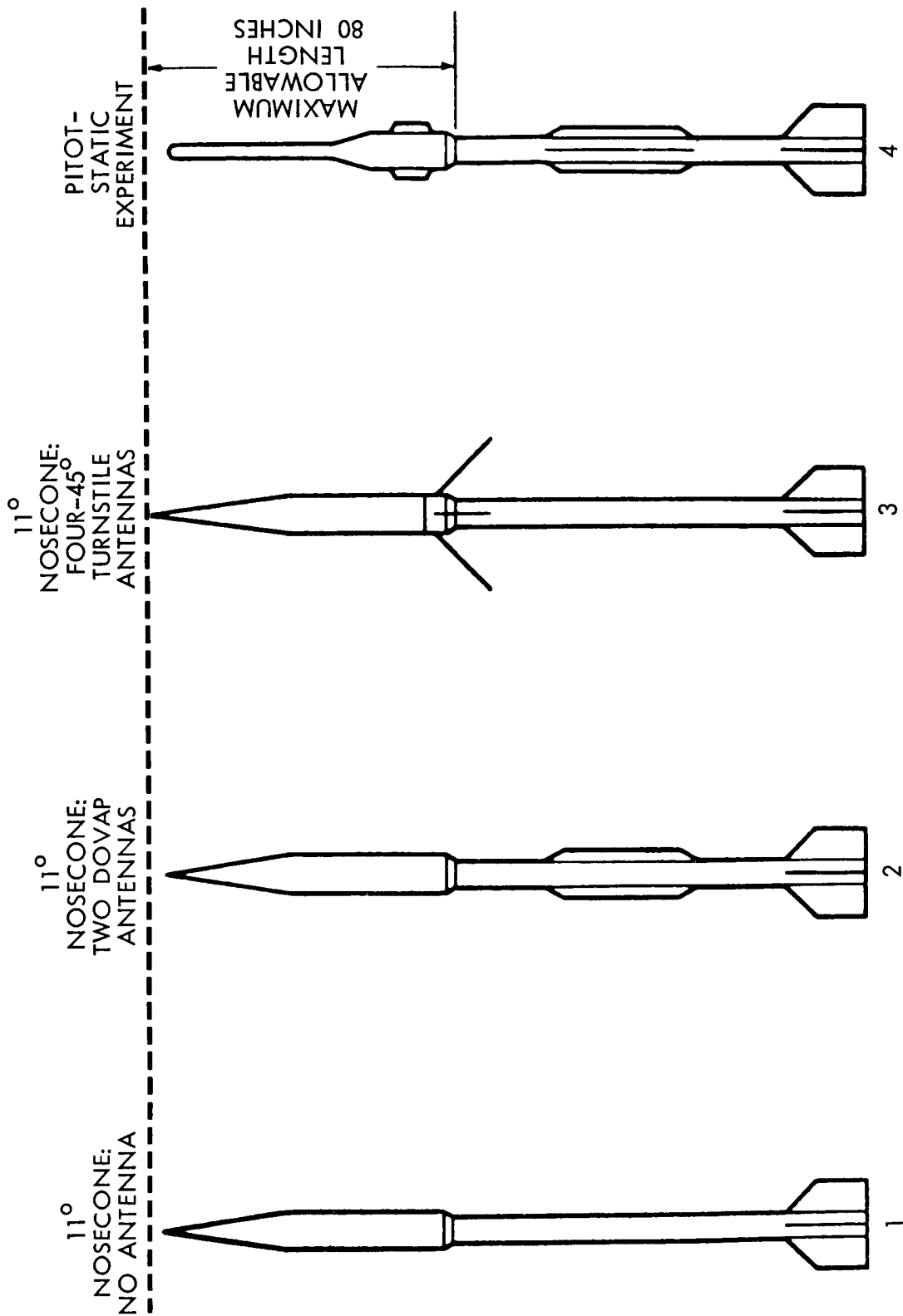


Figure 1. Standard Drag Cases

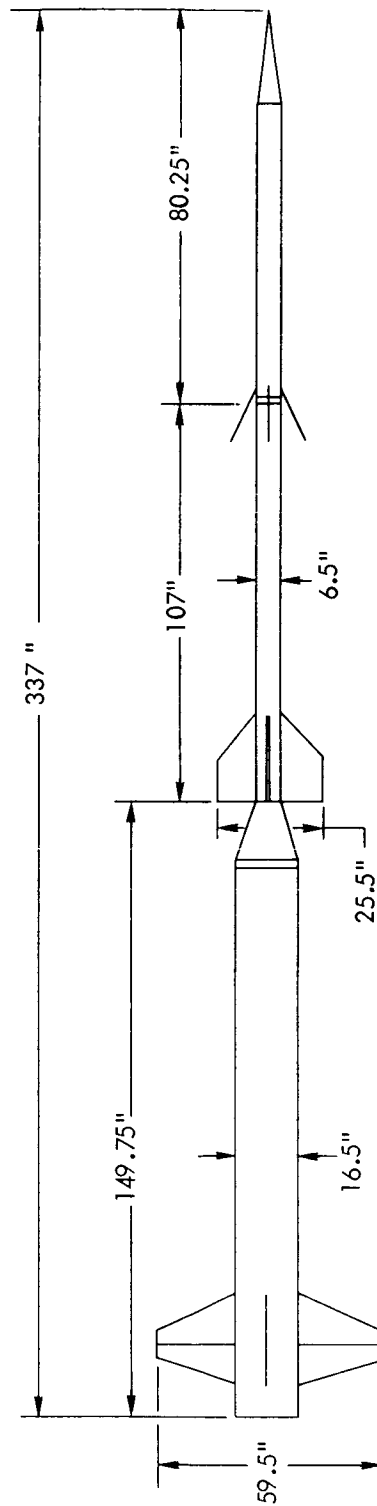


Figure 2. 14.07 UE Sketch

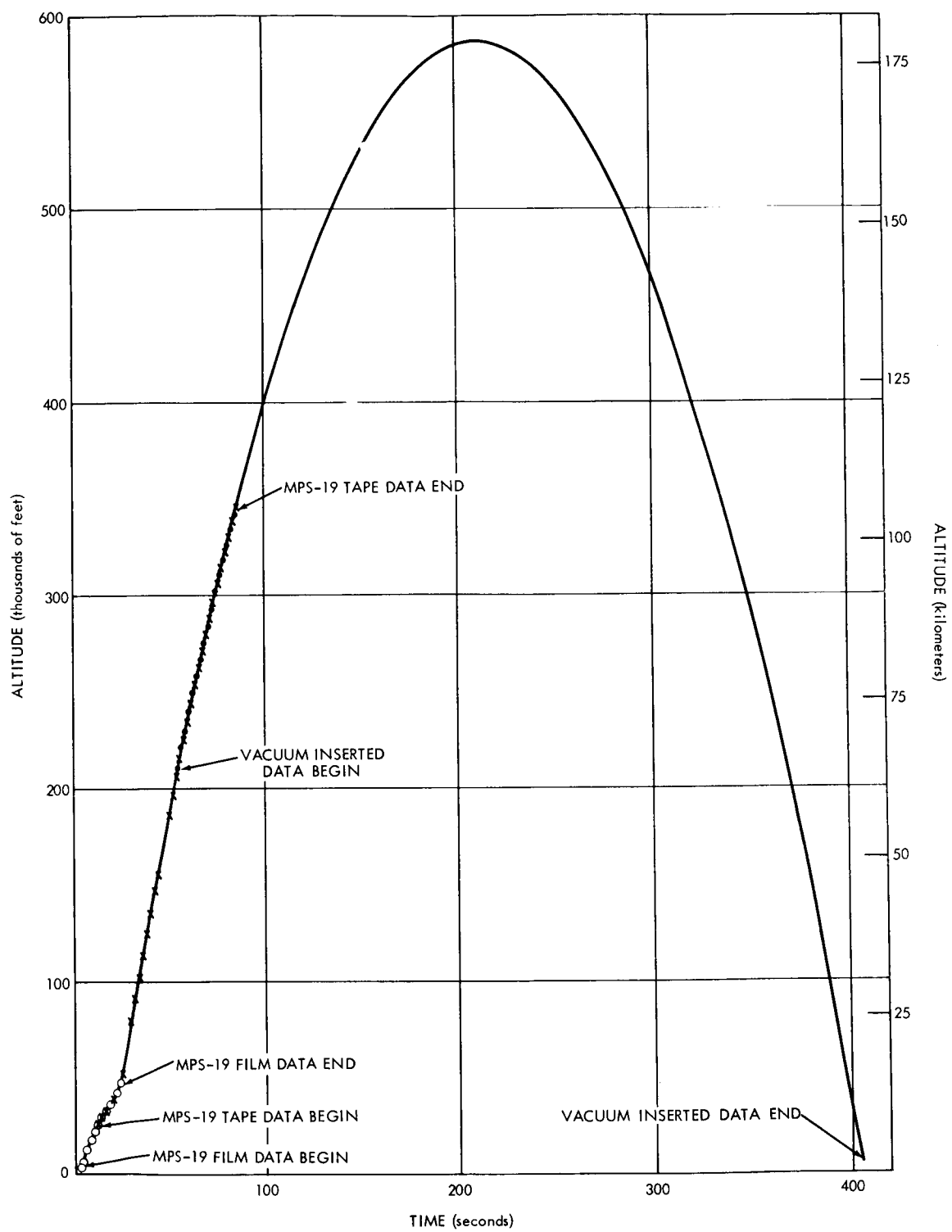


Figure 3. 14.07 UE Radar Plot, Altitude vs Time

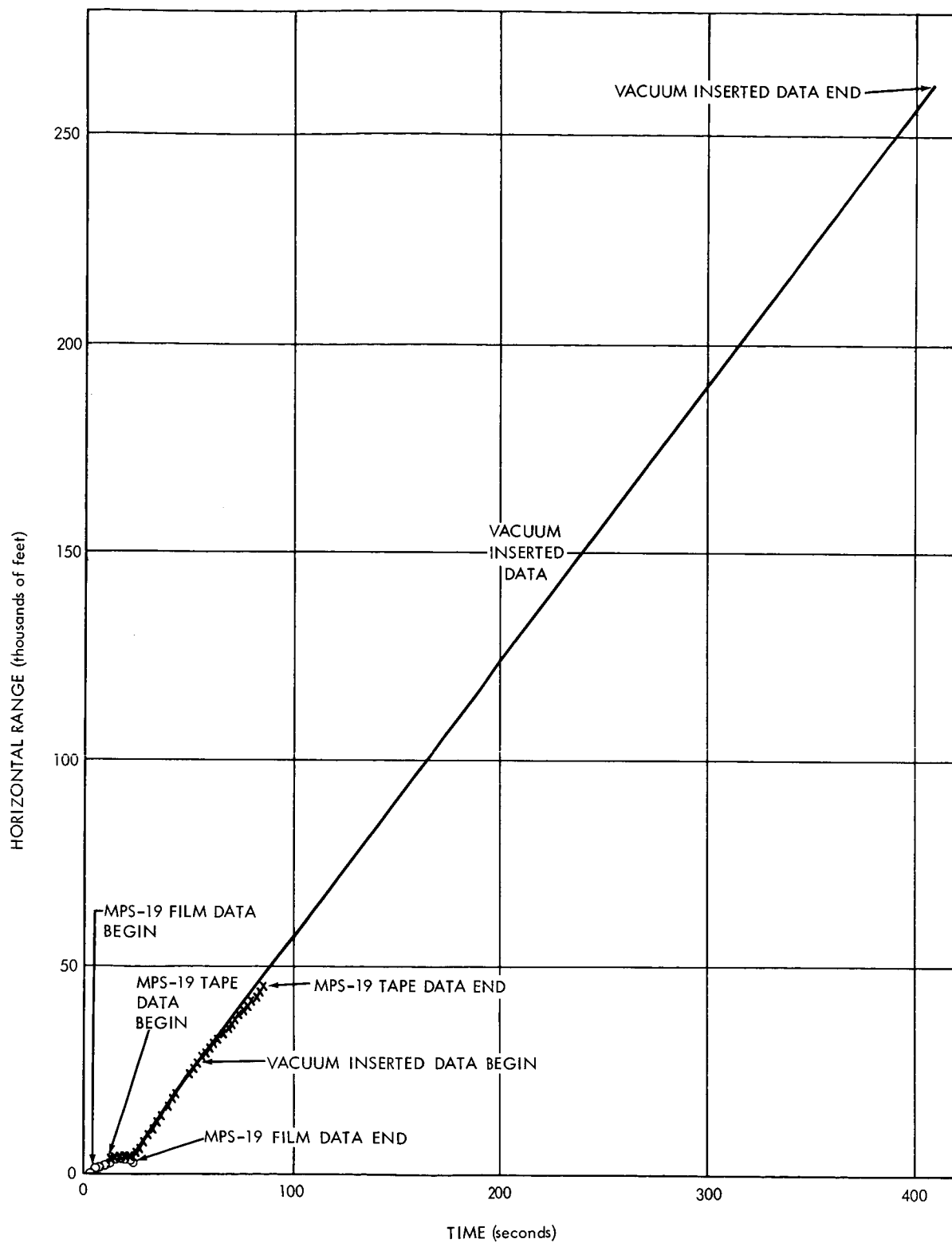


Figure 4. 14.07 UE Radar Plot, Horizontal Range vs Time

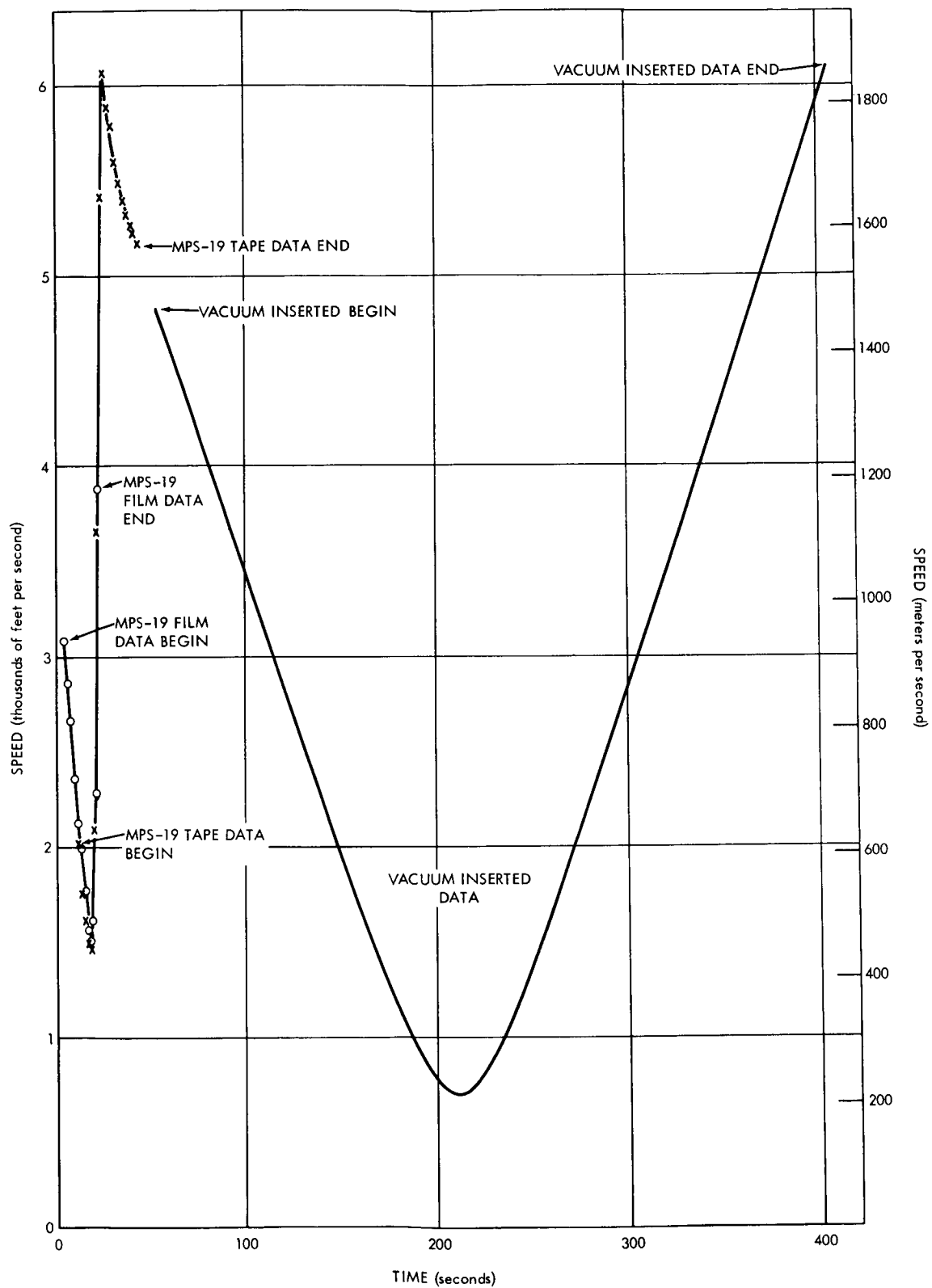


Figure 5. 14.07 UE Radar Plot, Speed vs Time



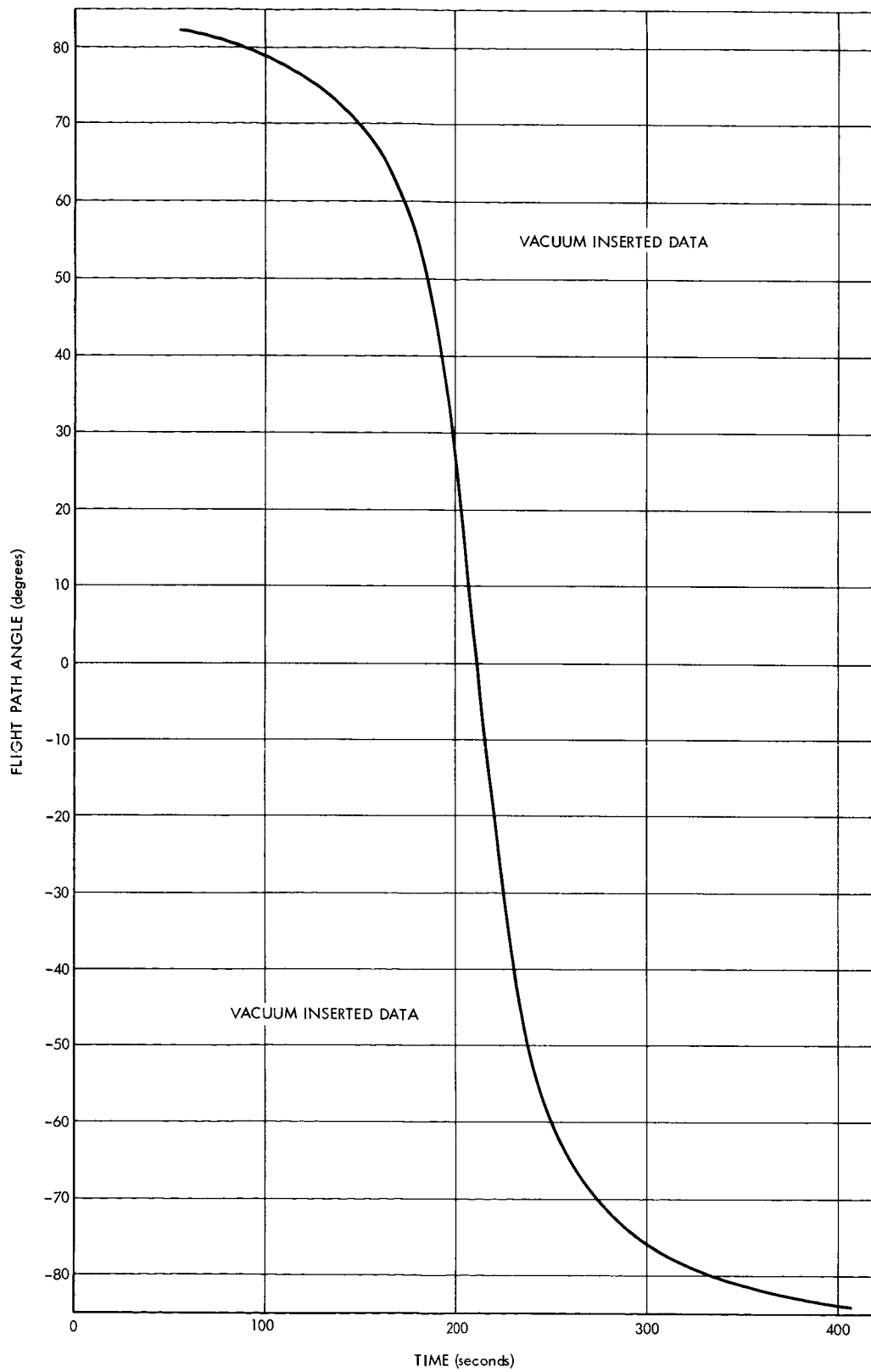


Figure 6. 14.07 UE Radar Plot, Flight Path Angle vs Time

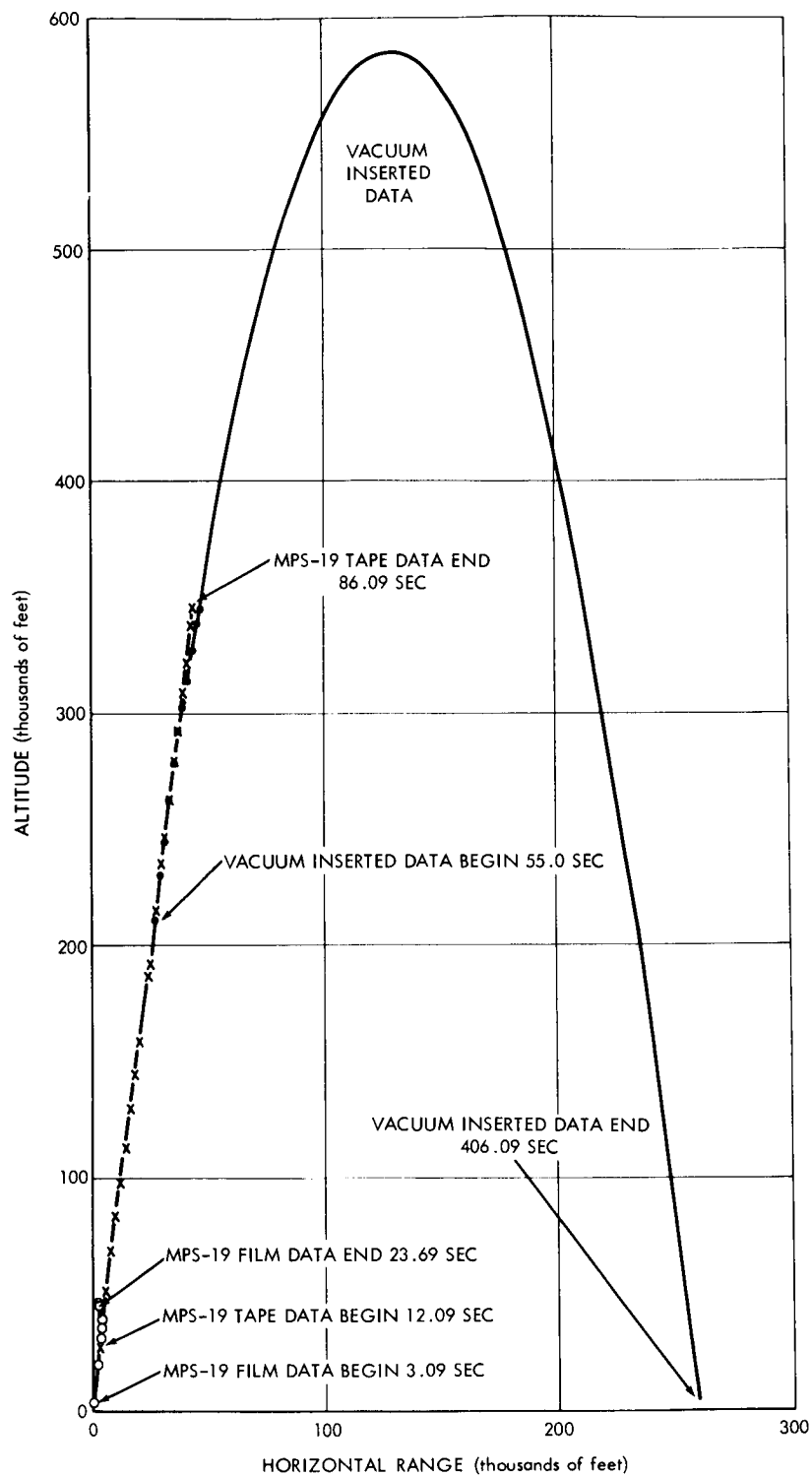


Figure 7. 14.07 UE Radar Plot, Altitude vs Horizontal Range

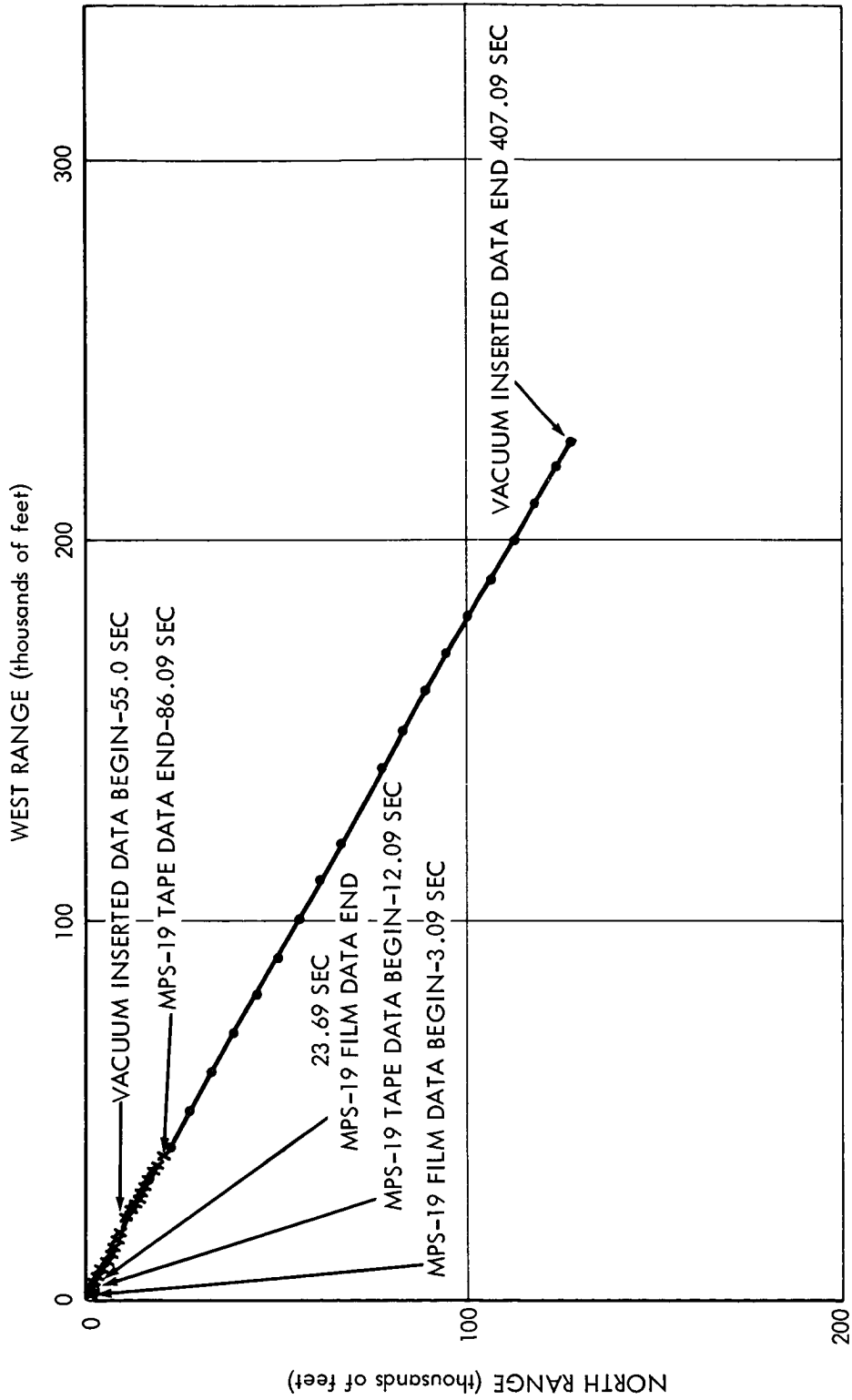


Figure 8. 14.07 UE Radar Plot, North Range vs West Range

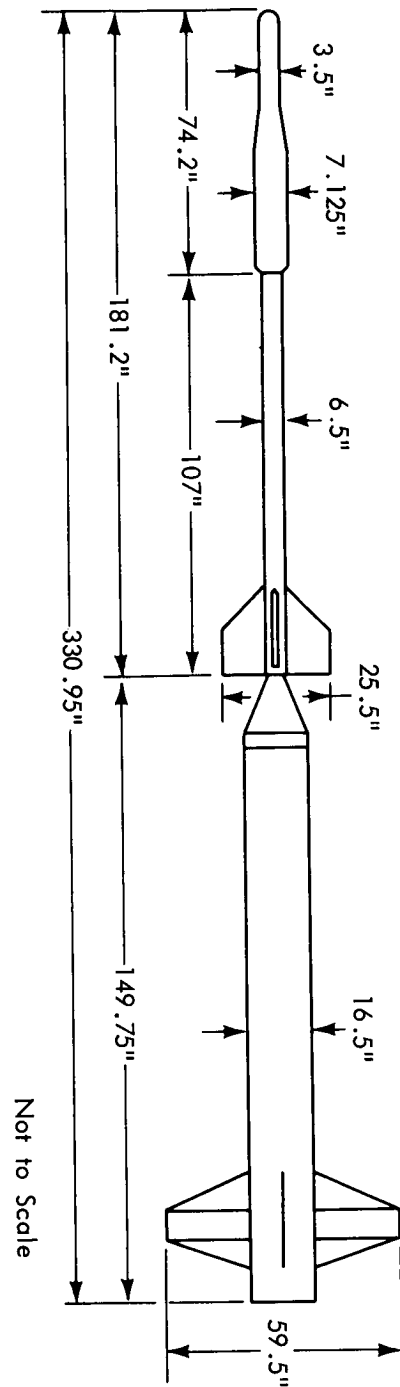


Figure 9. 14.25 UA Sketch

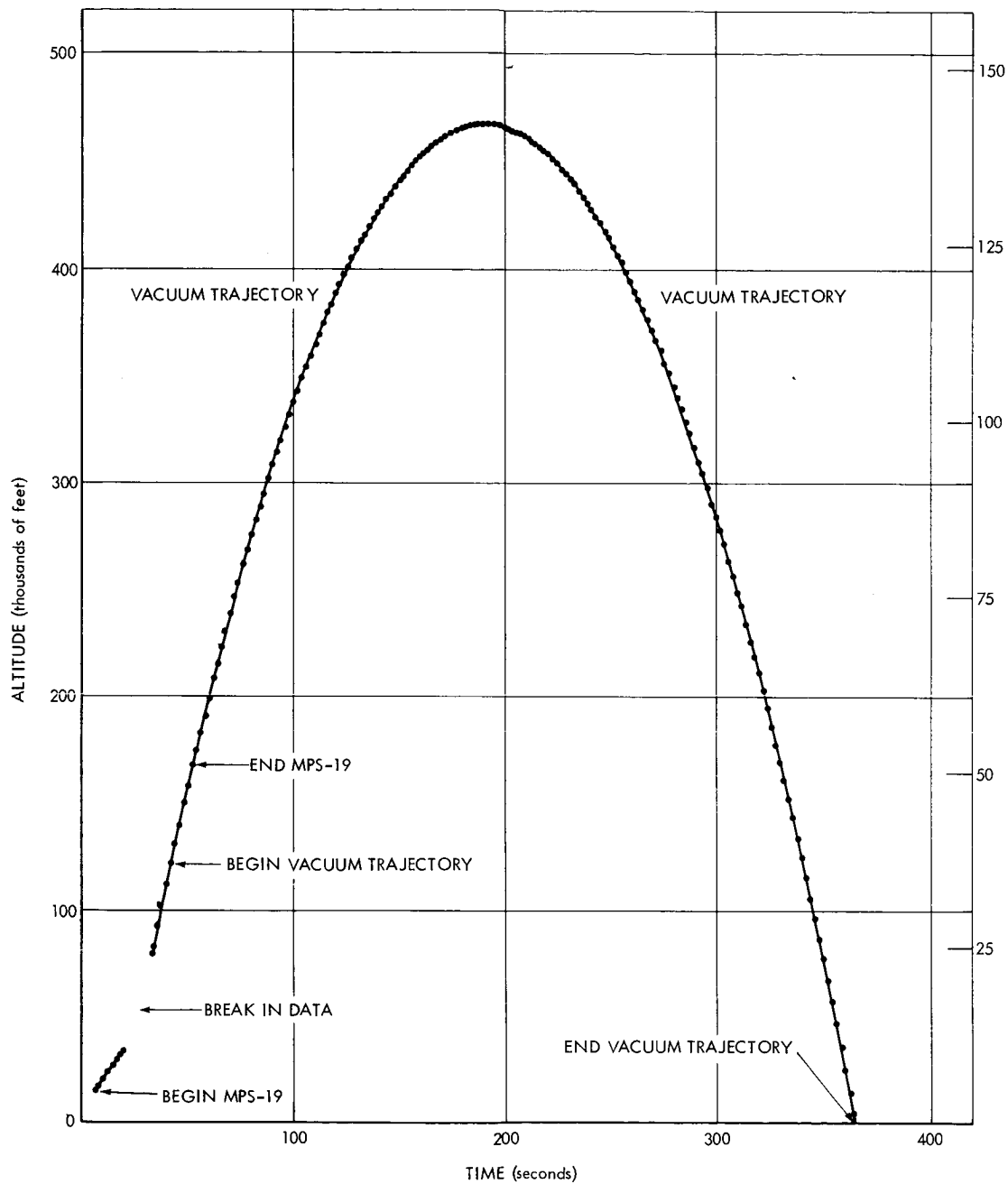


Figure 10. 14.25 UA Radar Plot, Altitude vs Time

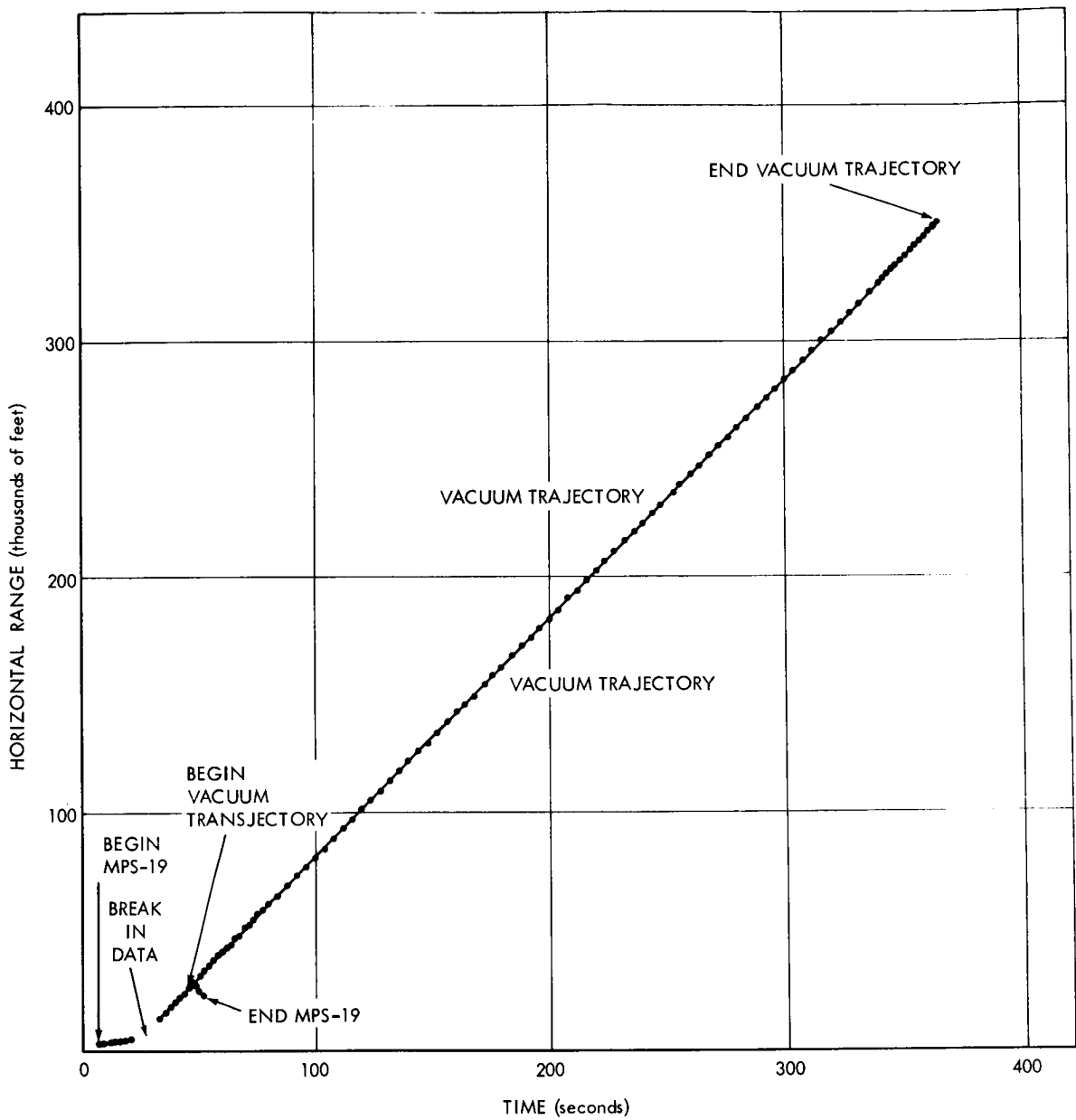


Figure 11. 14.25 UA Radar Plot, Horizontal Range vs Time

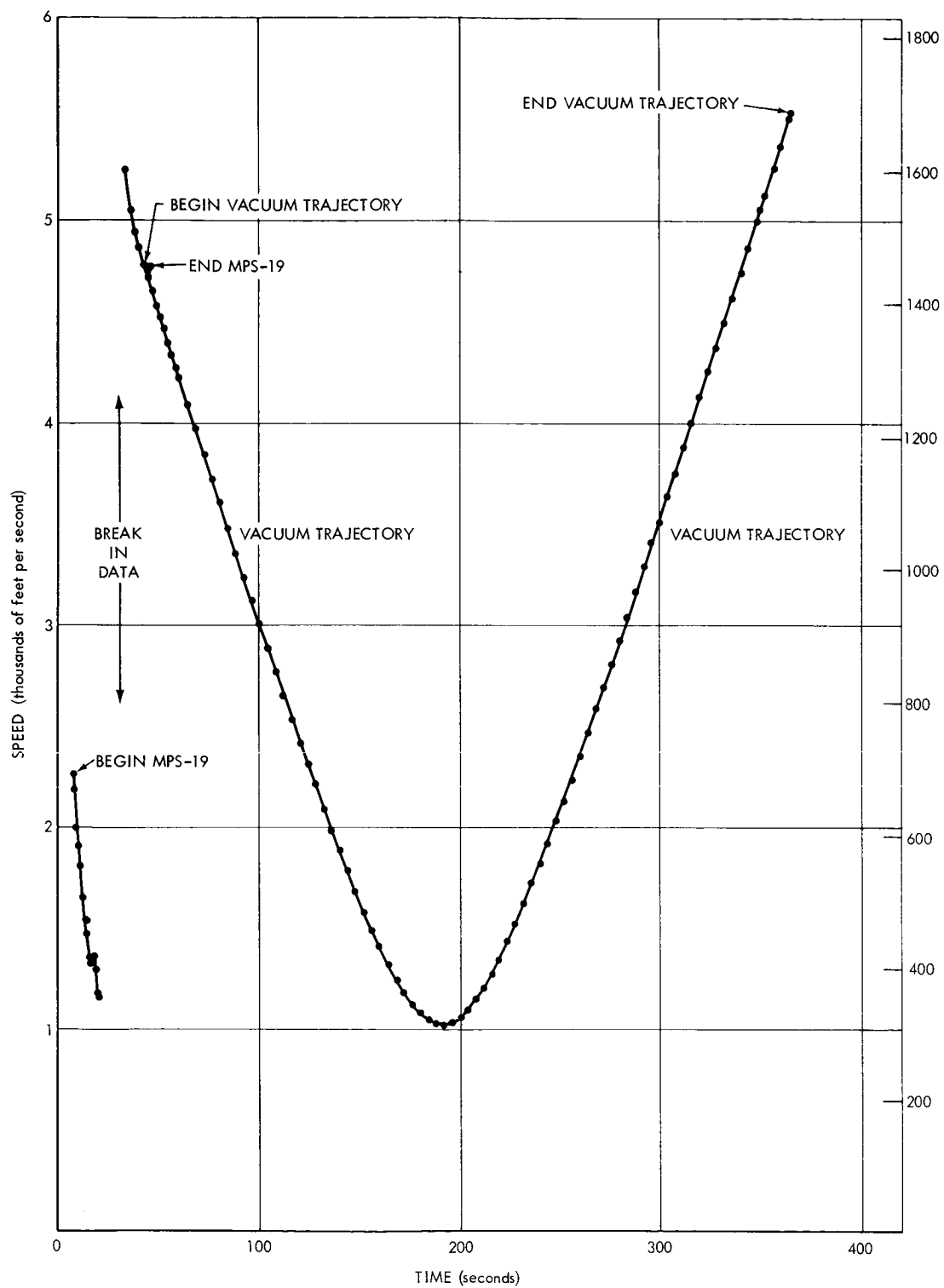


Figure 12. 14.25 UA Radar Plot, Speed vs Time

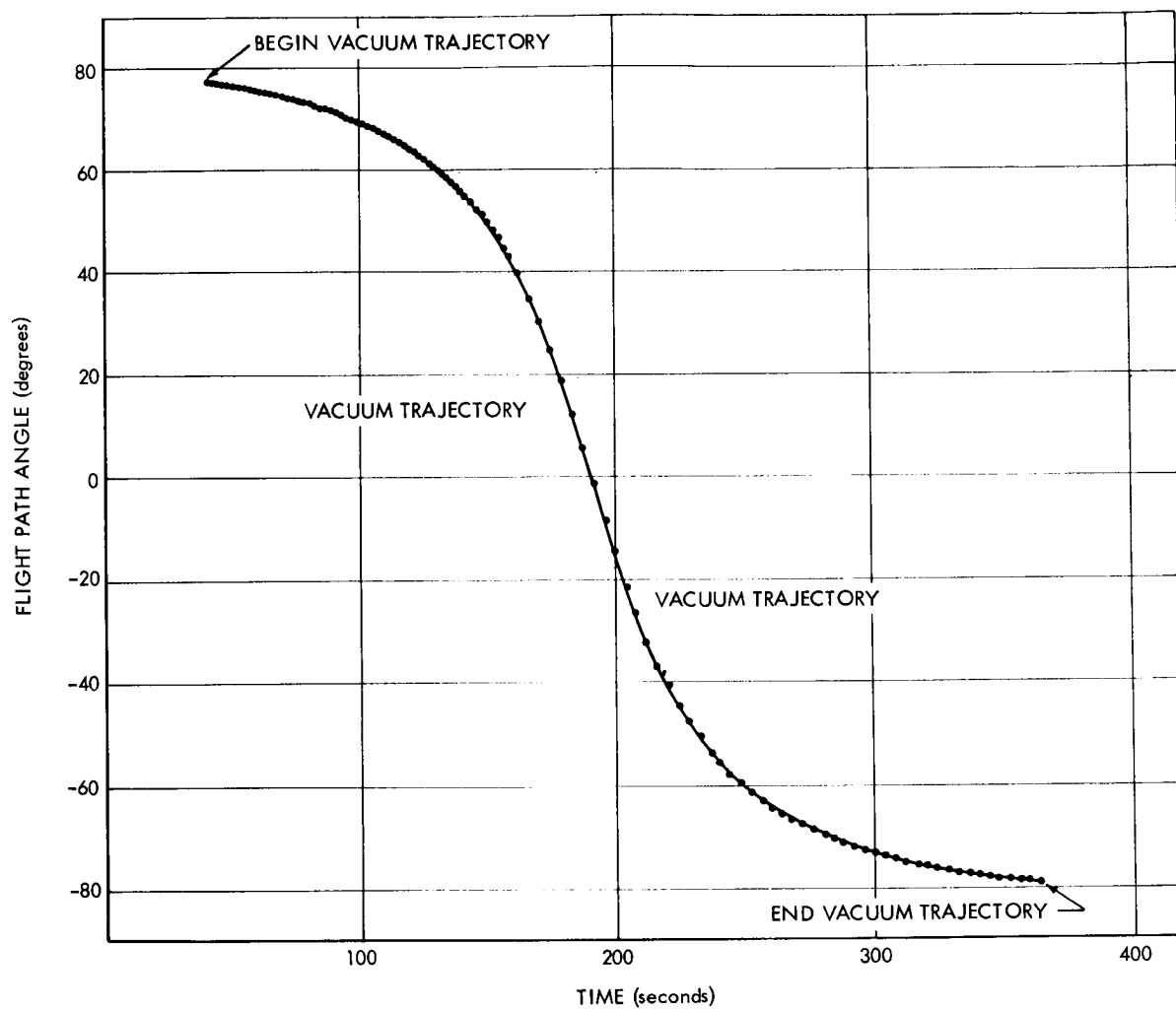


Figure 13. 14.25 UA Radar Plot, Flight Path Angle vs Time



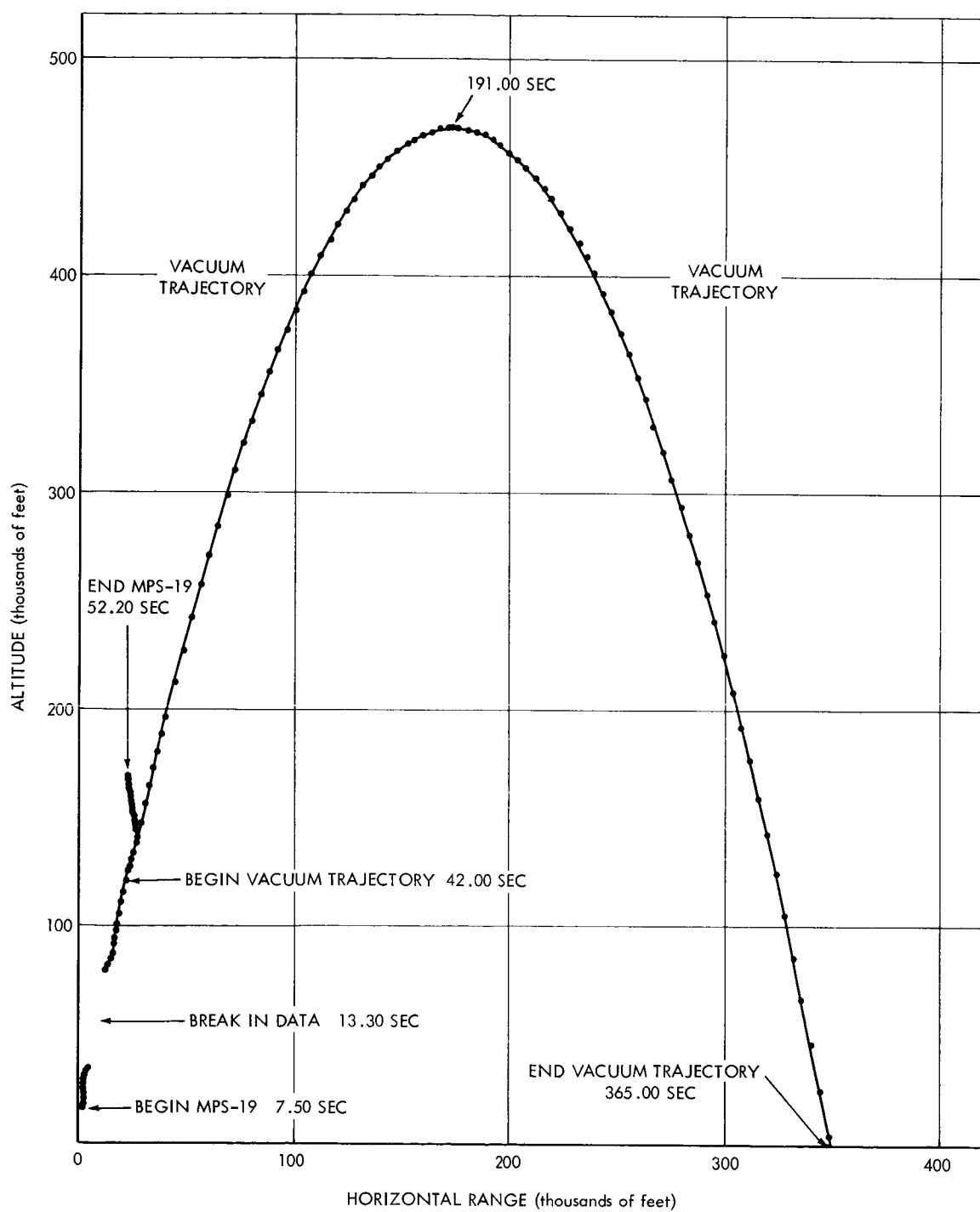


Figure 14. 14.25 UA Radar Plot, Altitude vs Horizontal Range

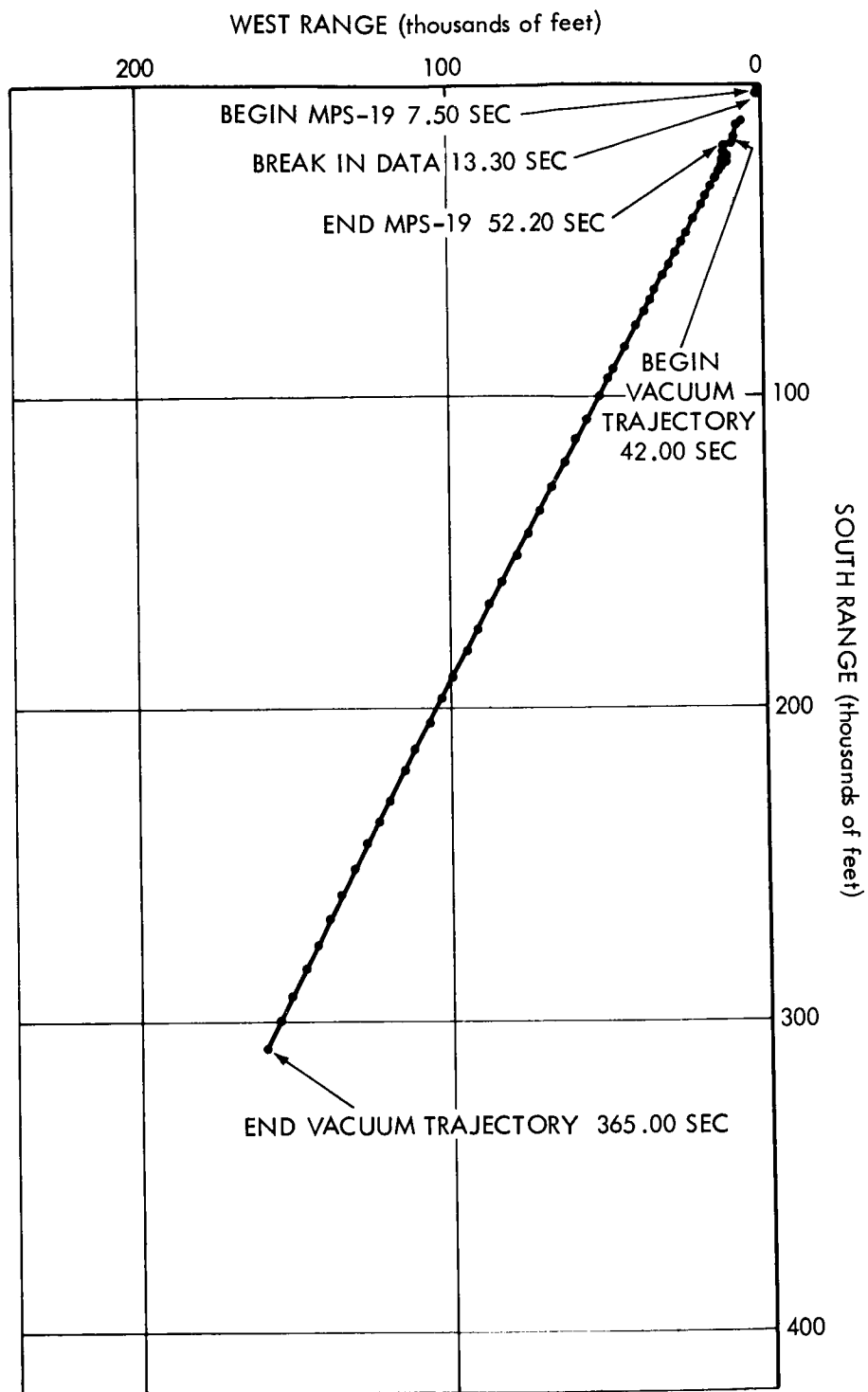


Figure 15. 14.25 UA Radar Plot, South Range vs West Range

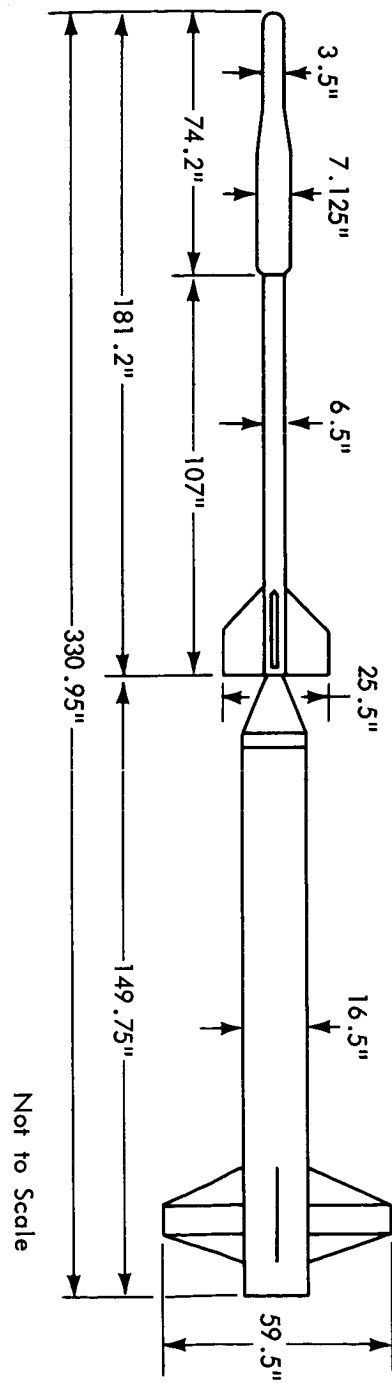


Figure 16. 14.26 UA Sketch

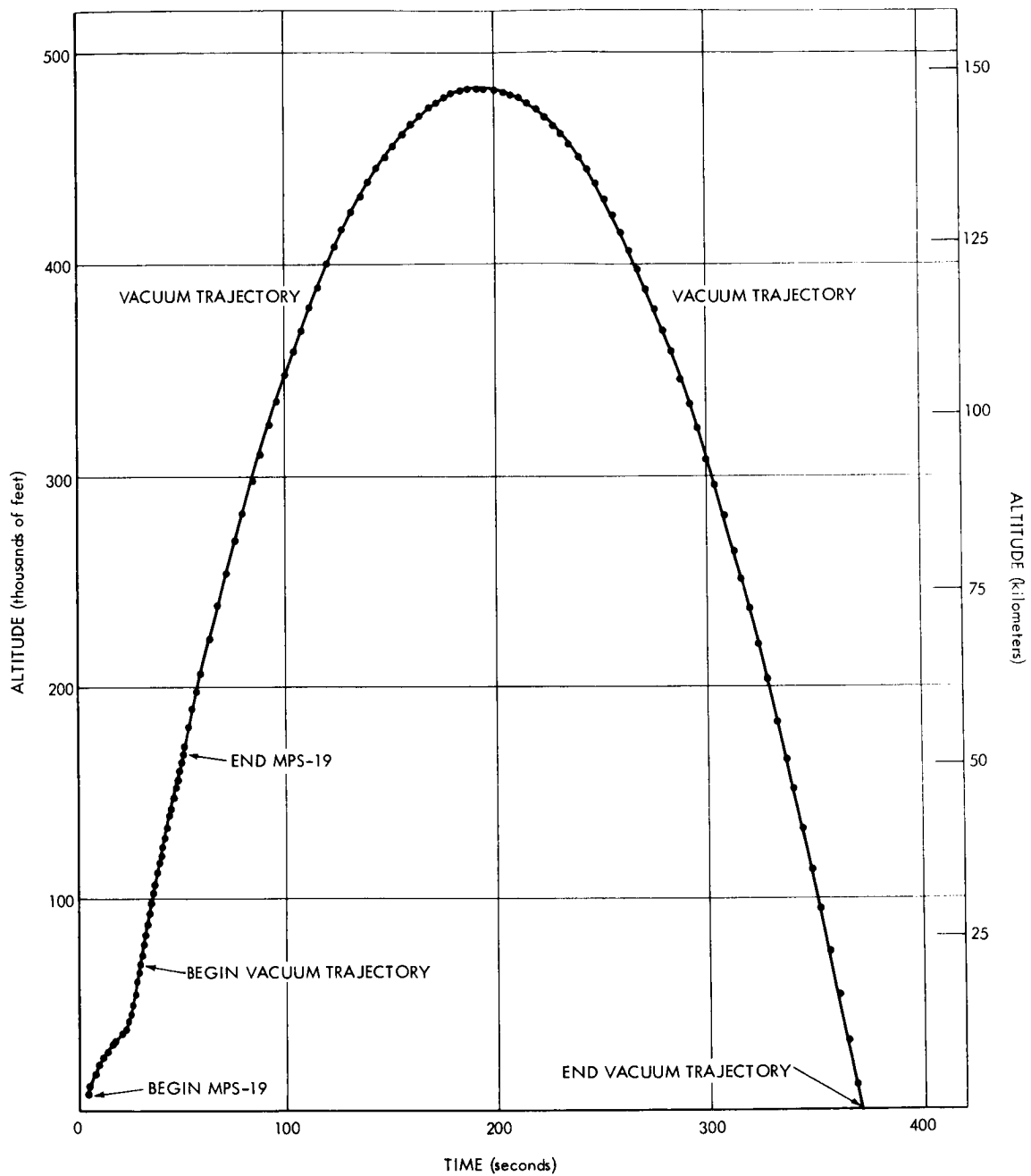


Figure 17. 14.26 UA Radar Plot, Altitude vs Time

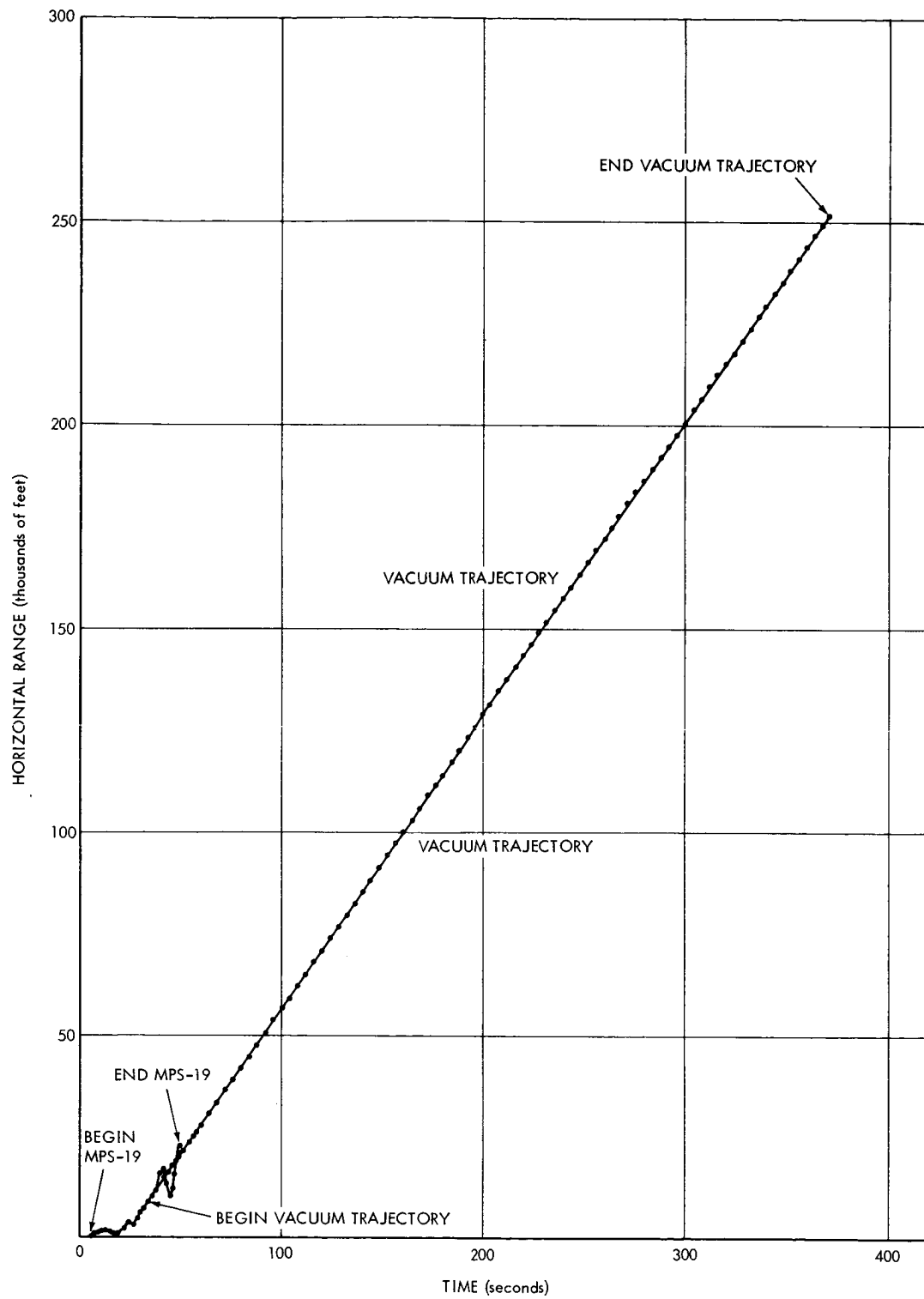


Figure 18. 14.26 UA Radar Plot, Horizontal Range vs Time

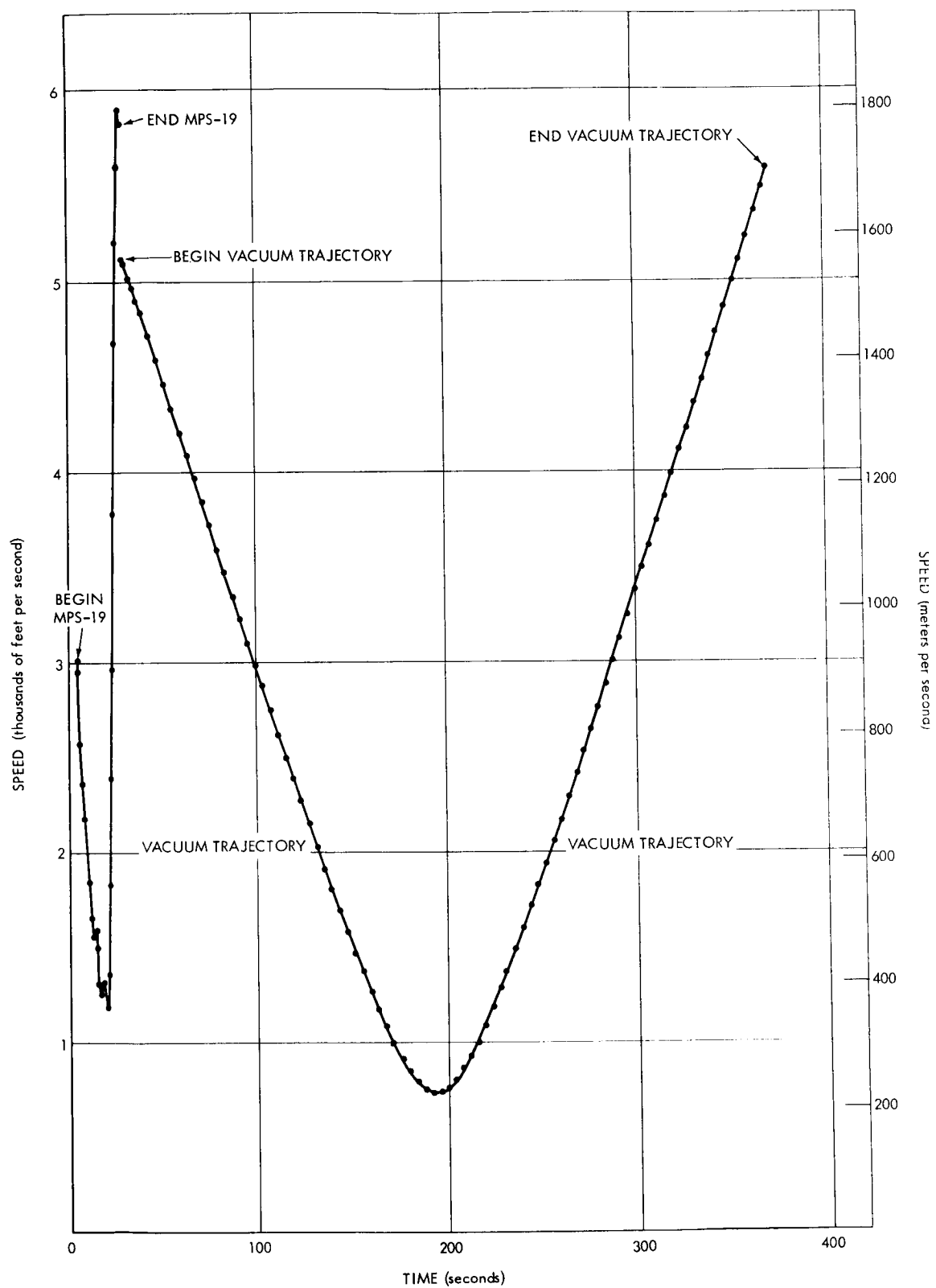


Figure 19. 14.26 UA Radar Plot, Speed vs Time

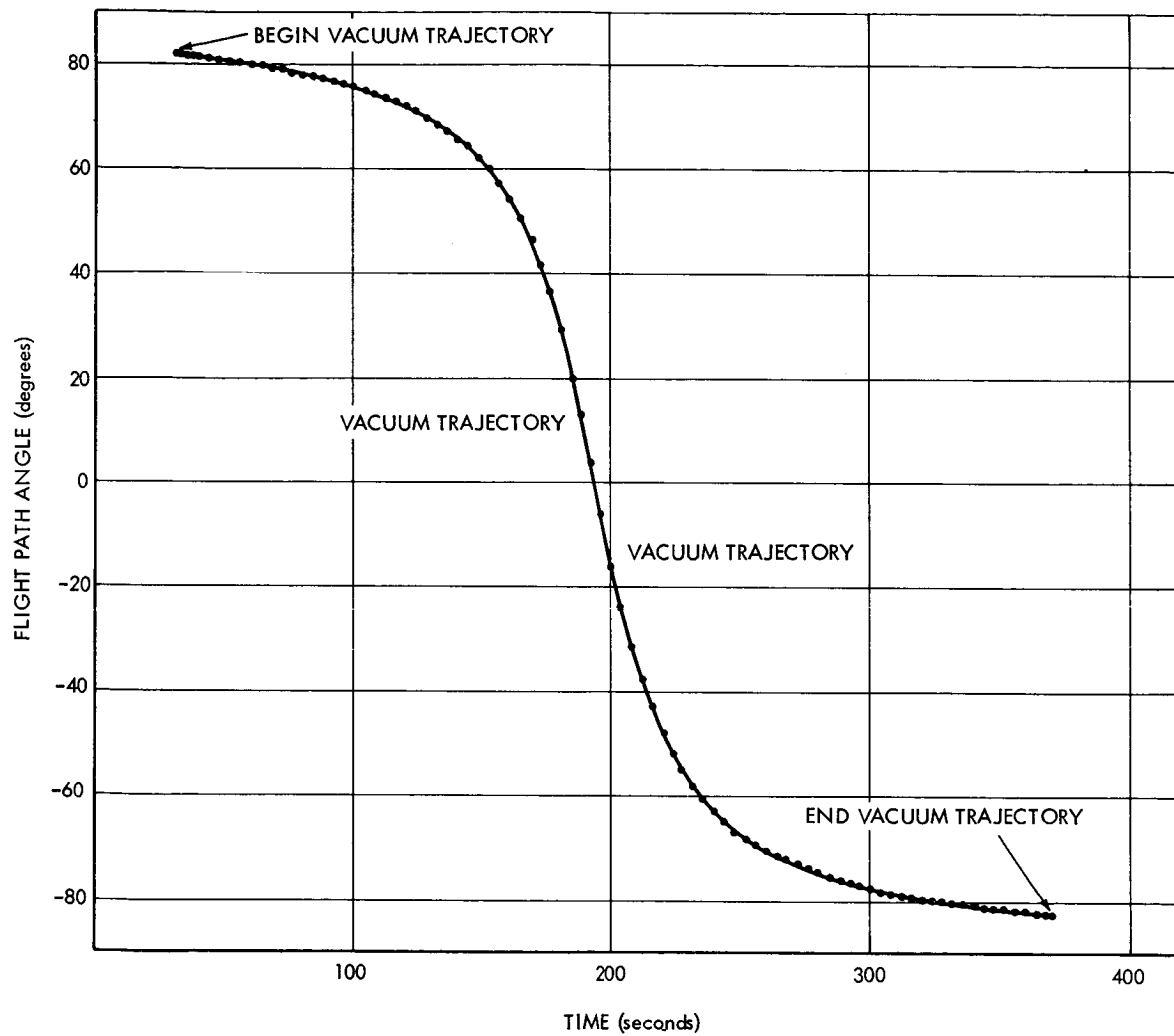


Figure 20. 14.26 UA Radar Plot, Flight Path Angle vs Time

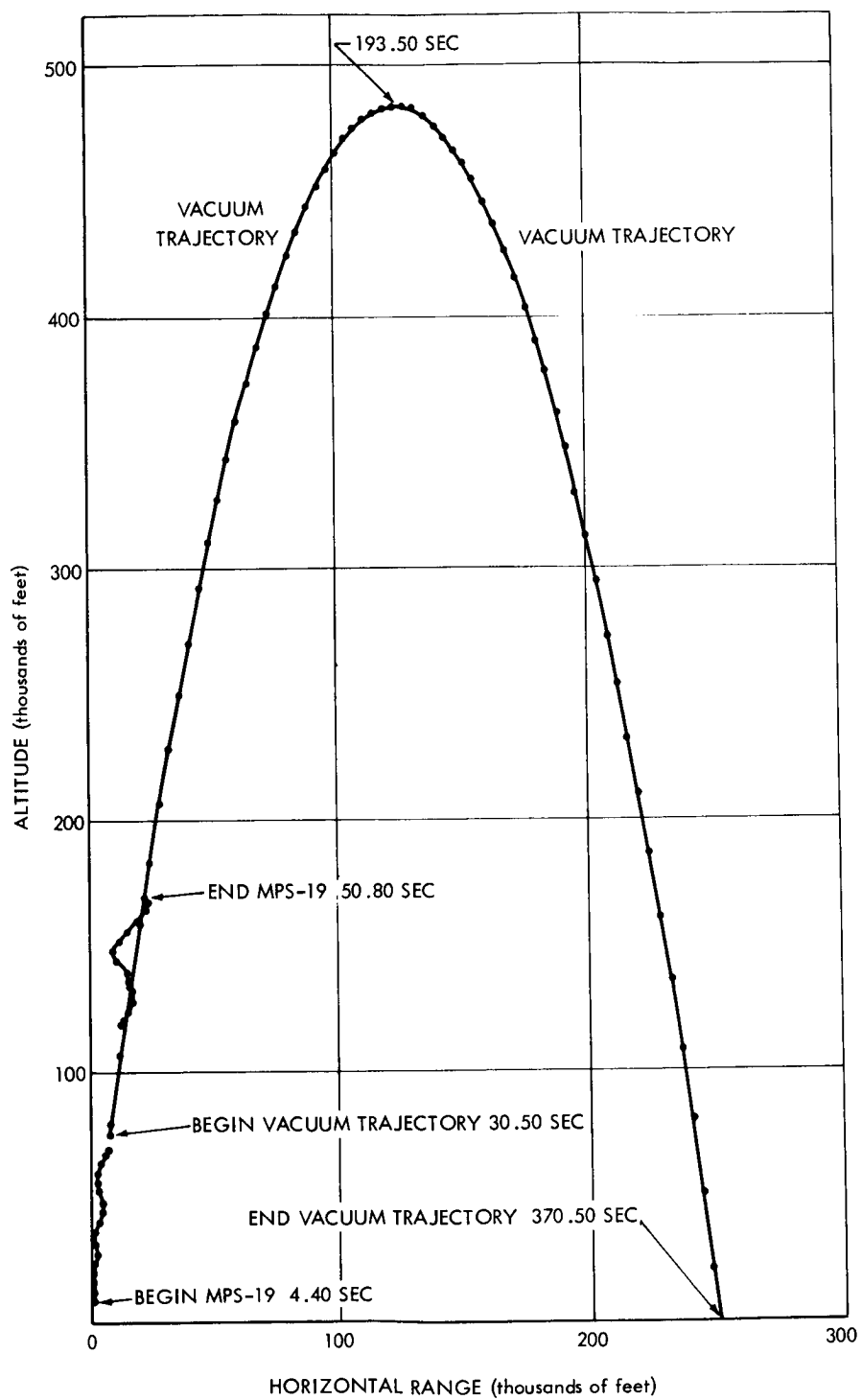


Figure 21. 14.26 UA Radar Plot, Altitude vs Horizontal Range



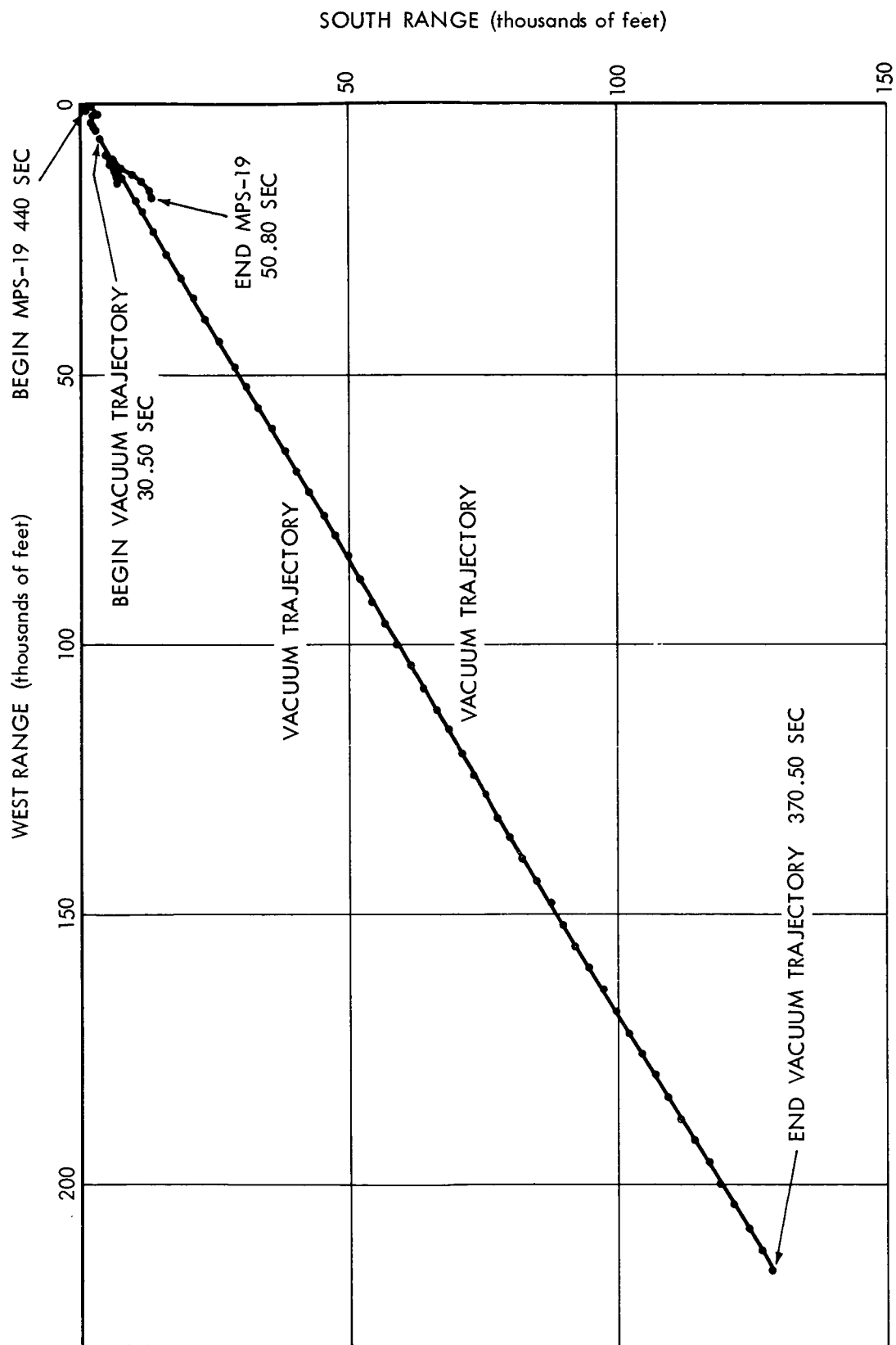


Figure 22. 14.26 UA Radar Plot, South Range vs West Range

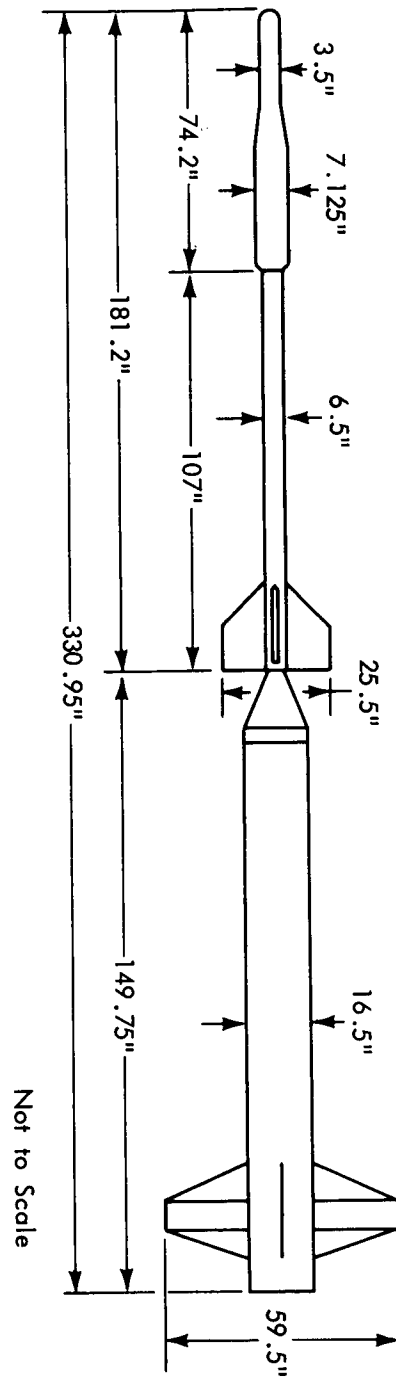


Figure 23. 14.27 UA Sketch

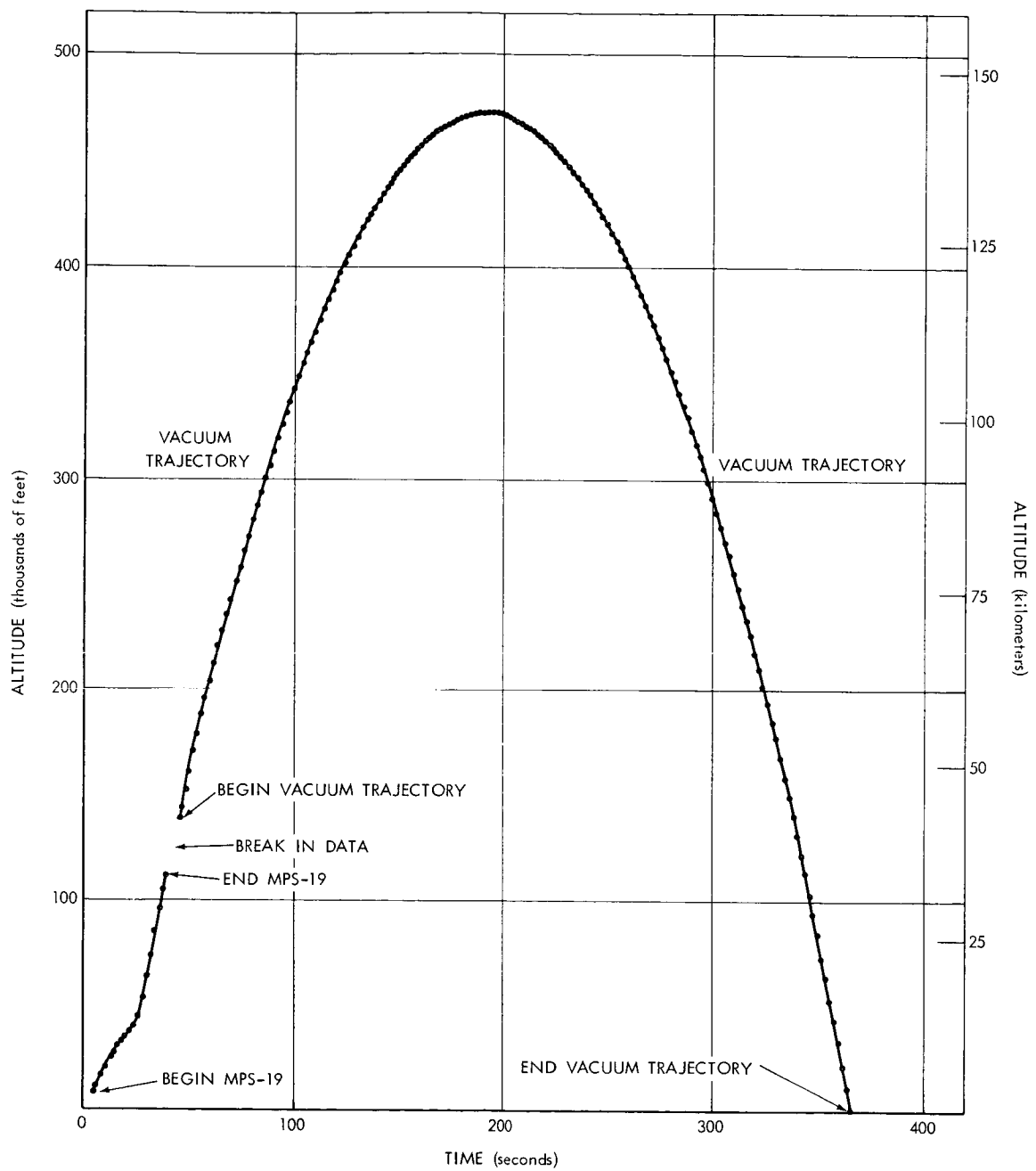


Figure 24. 14.27 UA Radar Plot, Altitude vs Time

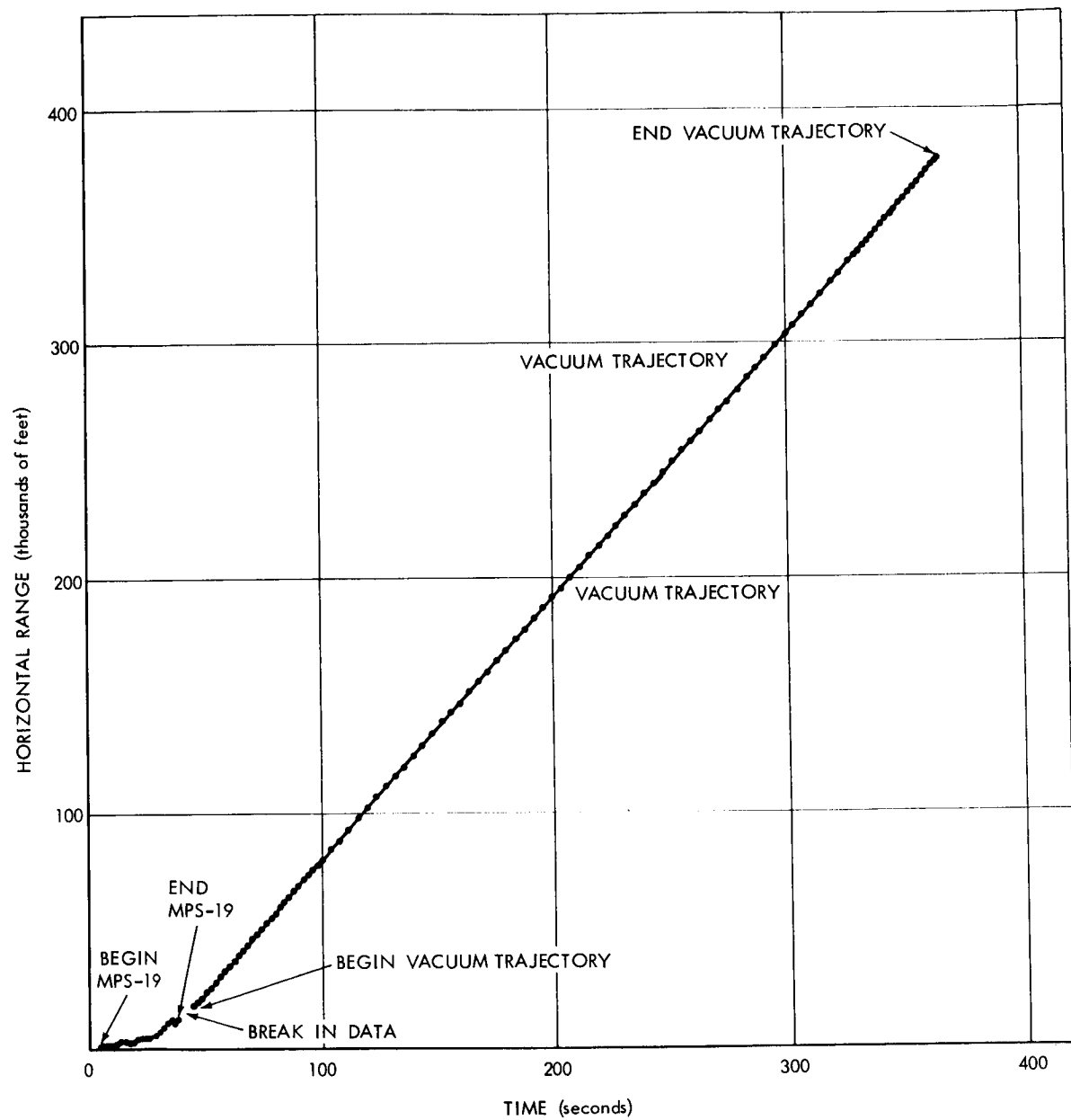


Figure 25. 14.27 UA Radar Plot, Horizontal Range vs Time

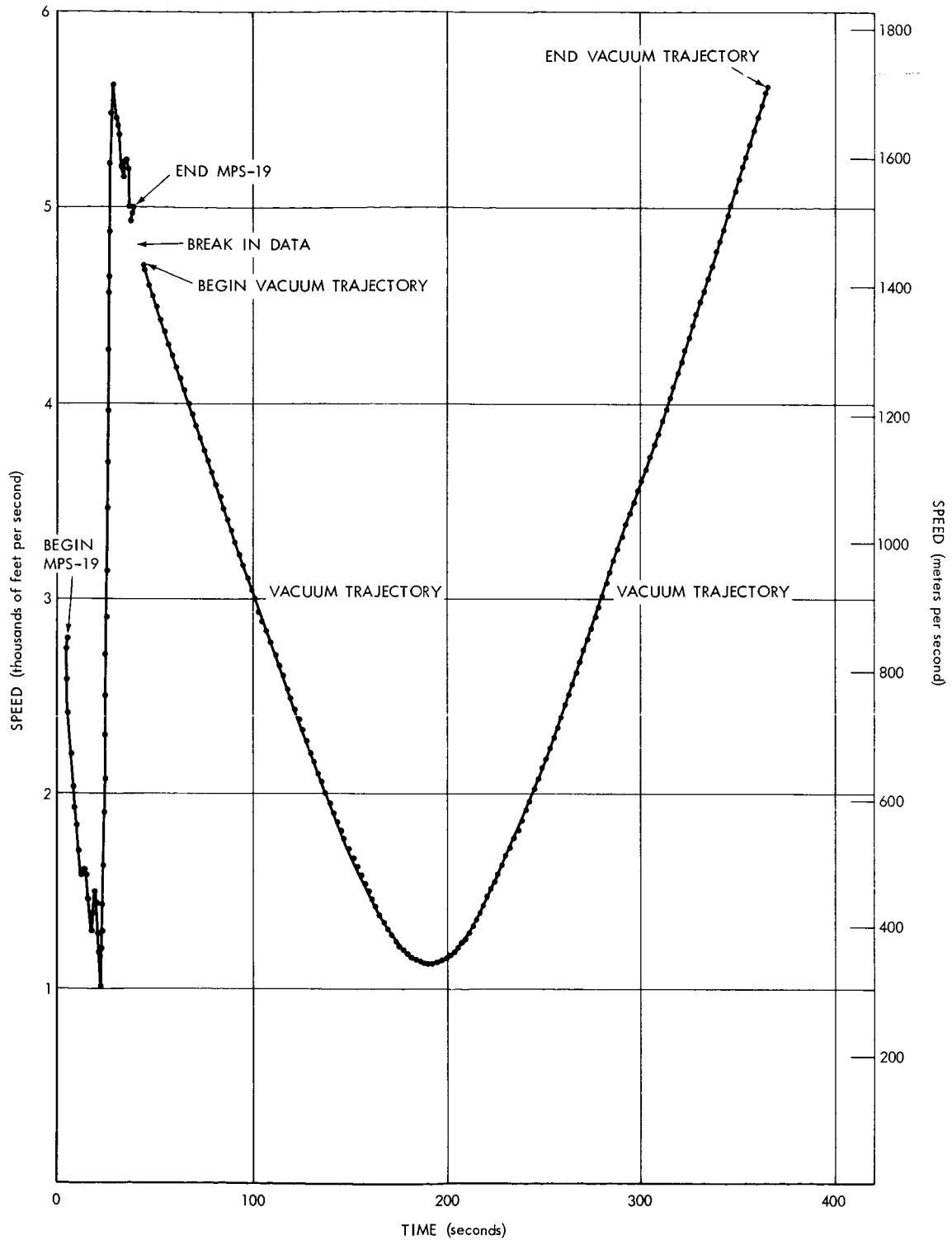


Figure 26. 14.27 UA Radar Plot, Speed vs Time

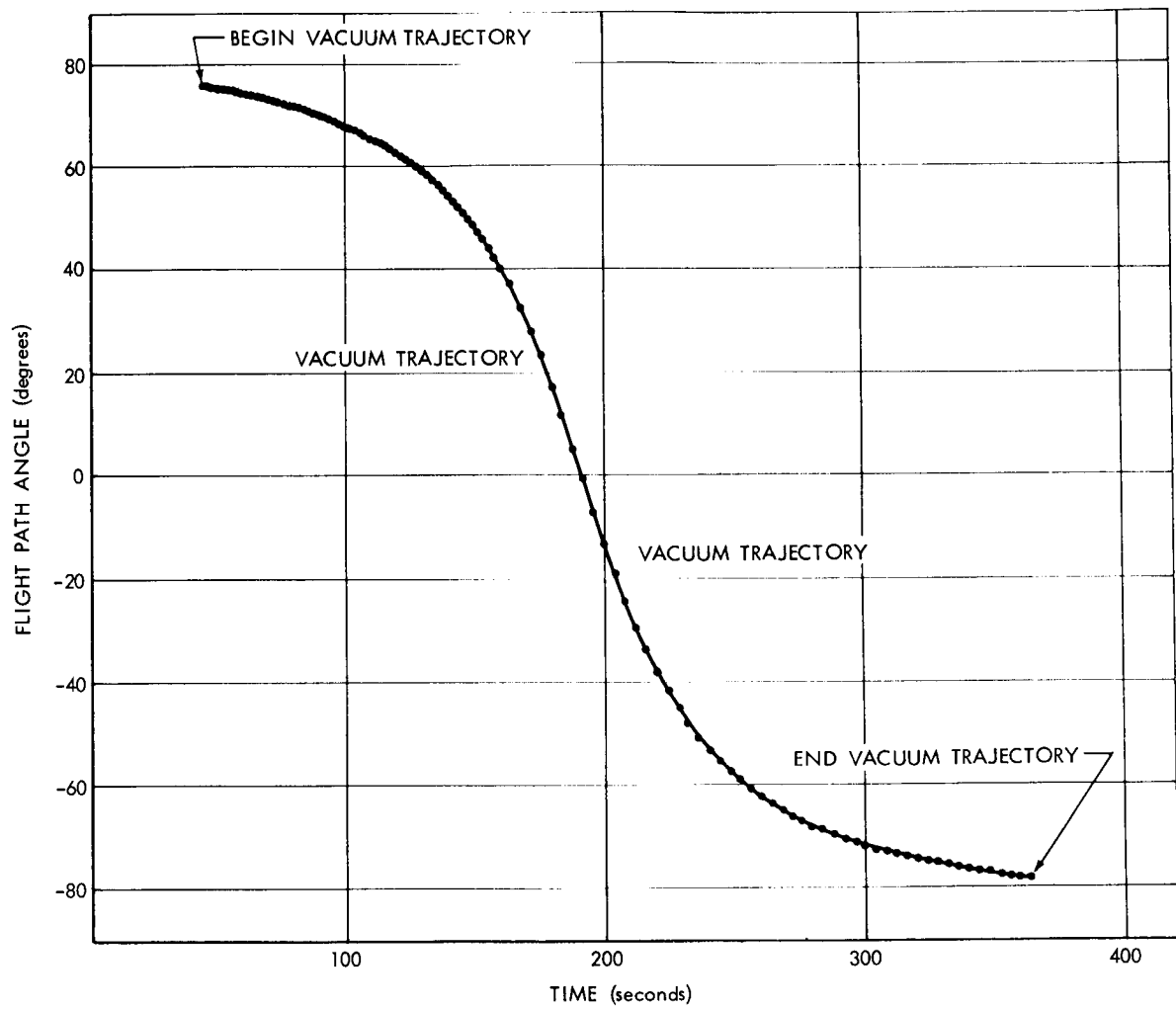


Figure 27. 14.27 UA Radar Plot, Flight Path Angle vs Time

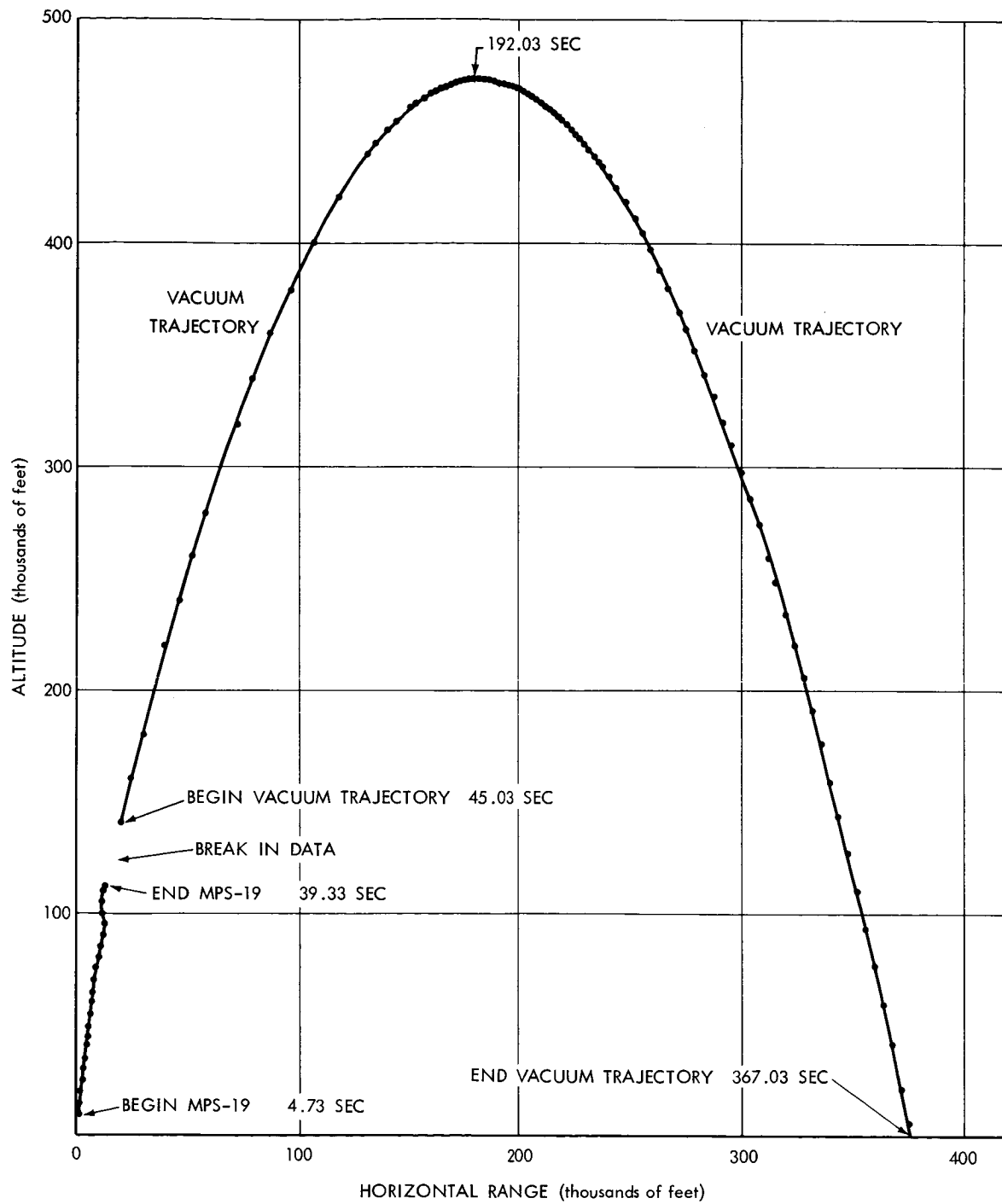


Figure 28. 14.27 UA Radar Plot, Altitude vs Horizontal Range

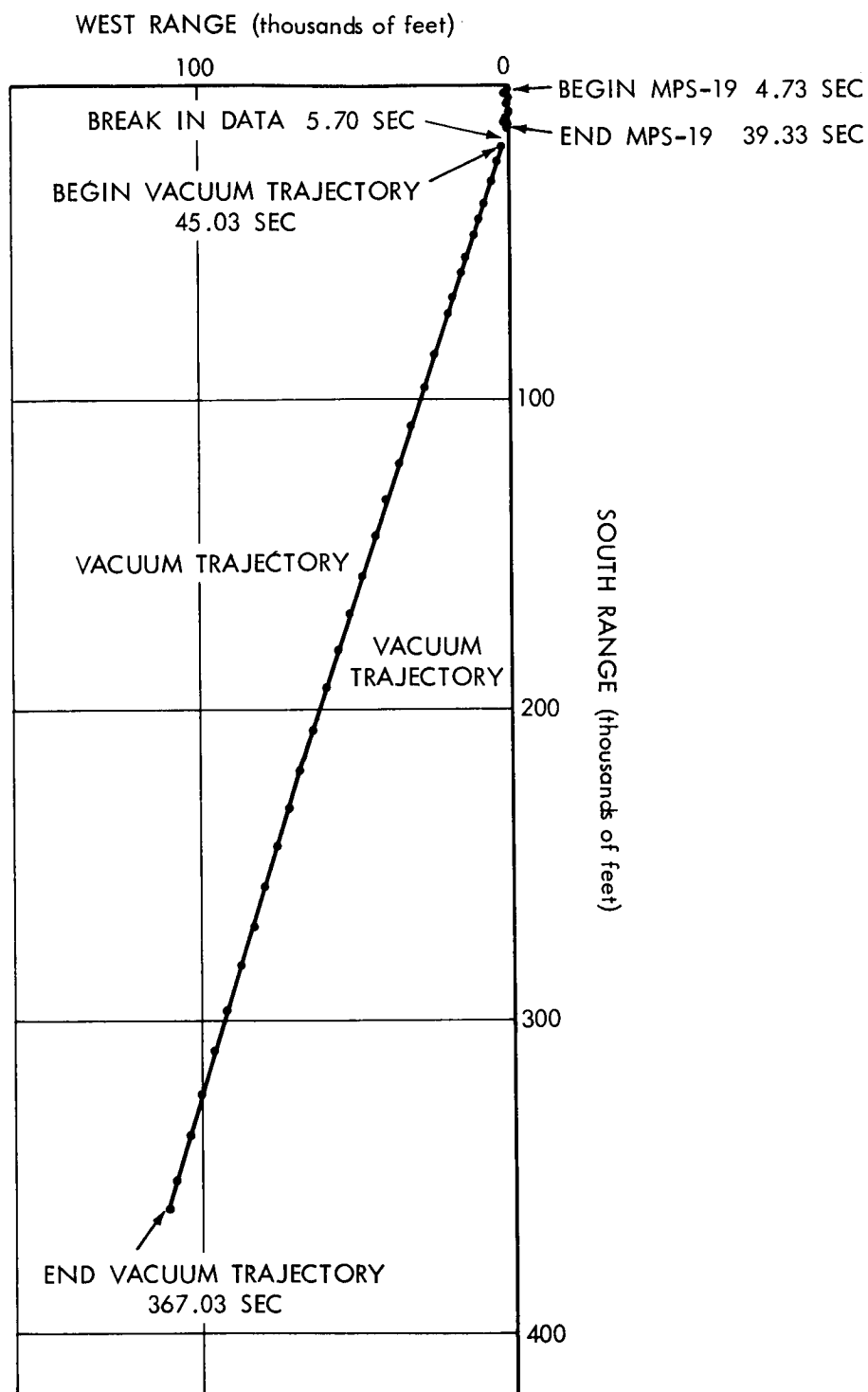


Figure 29. 14.27 UA Radar Plot, South Range vs West Range



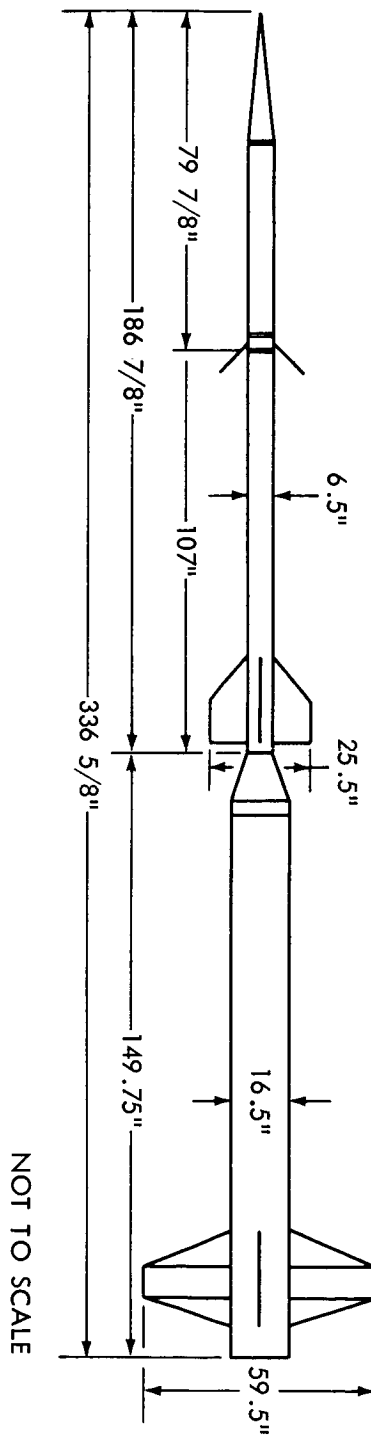


Figure 30. 14.61 UE Sketch

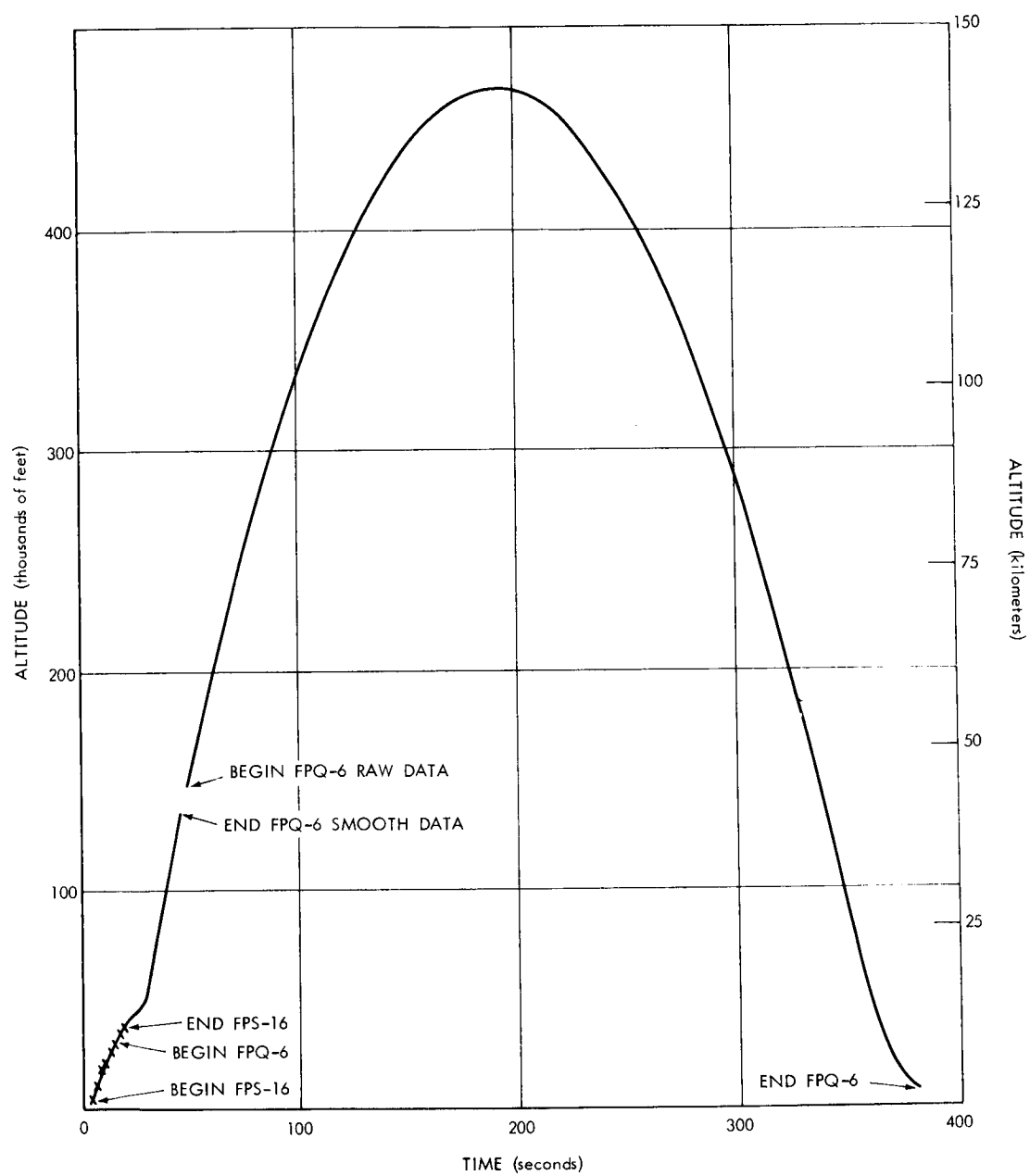


Figure 31. 14.61 UE Radar Plot, Altitude vs Time

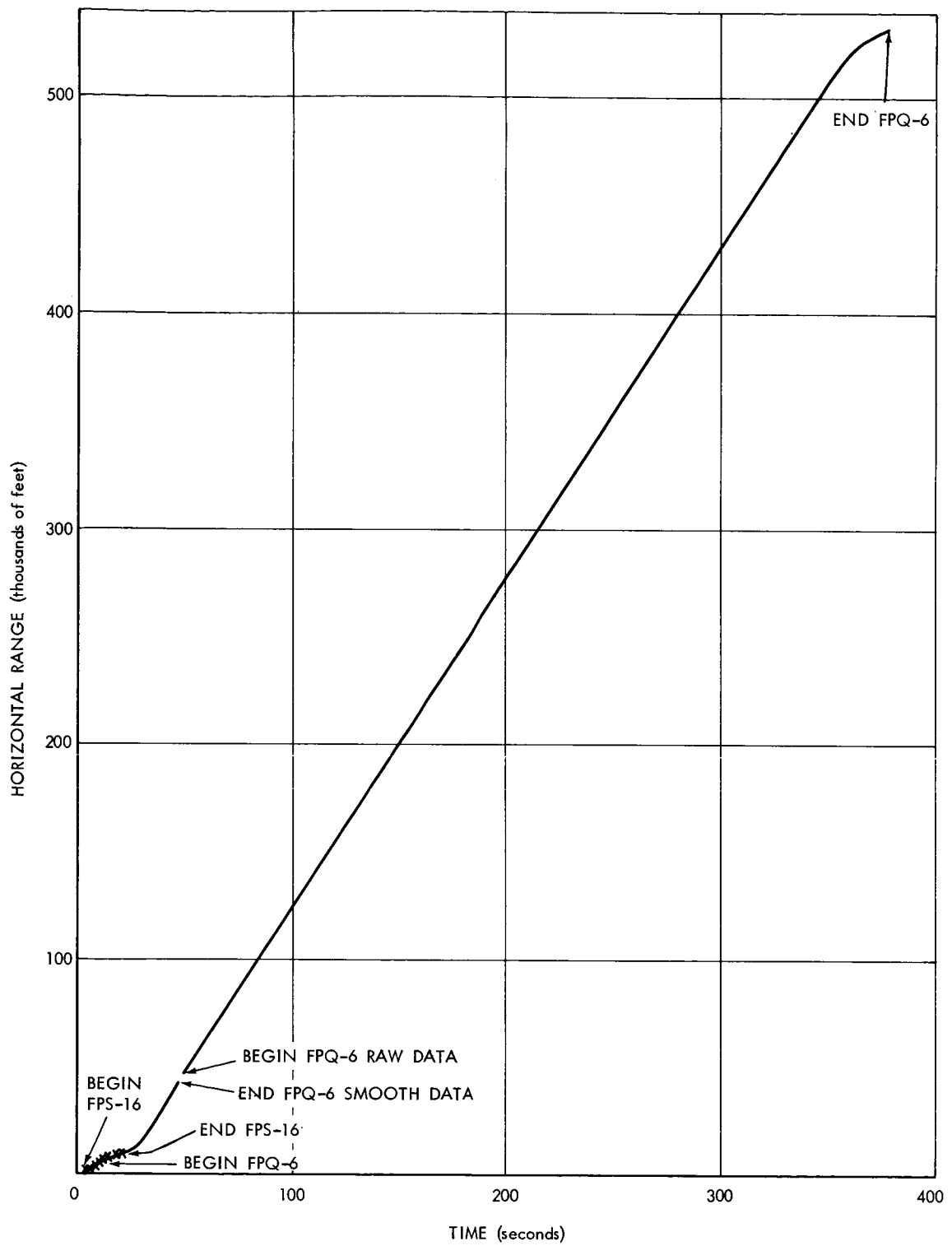


Figure 32. 14.61 UE Radar Plot, Horizontal Range vs Time

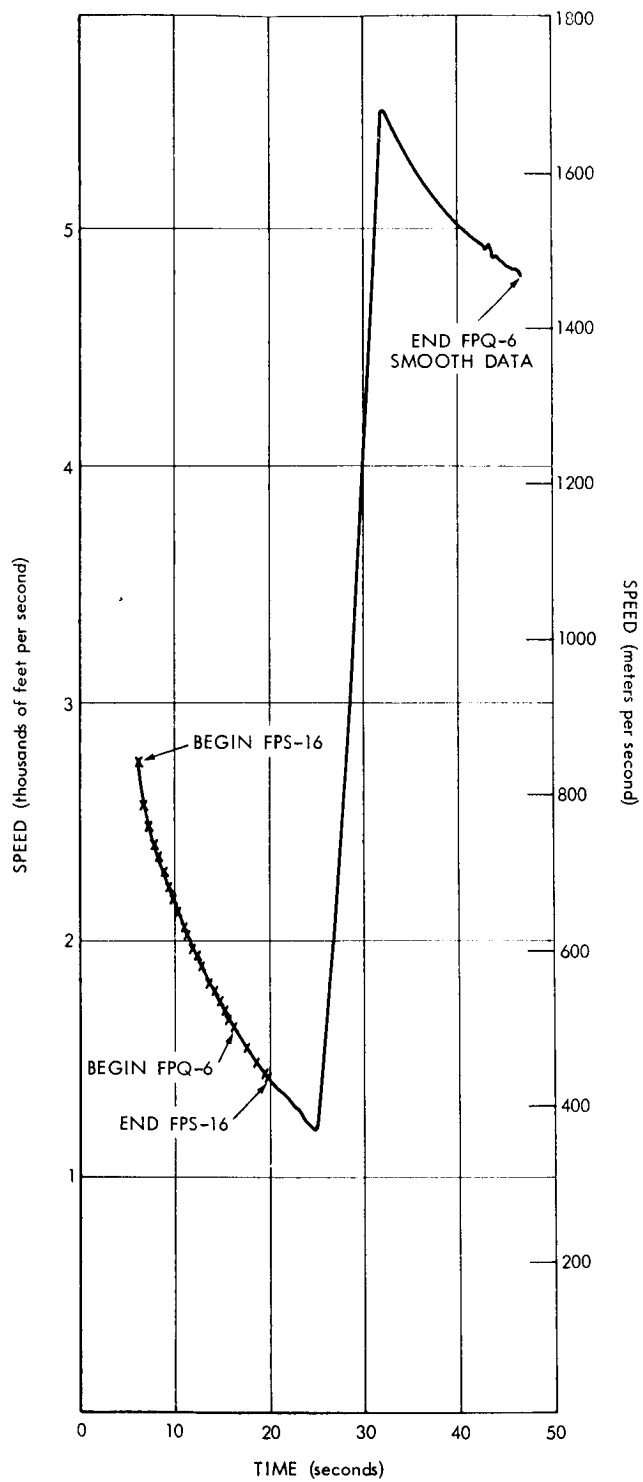


Figure 33. 14.61 UE Radar Plot, Speed vs Time

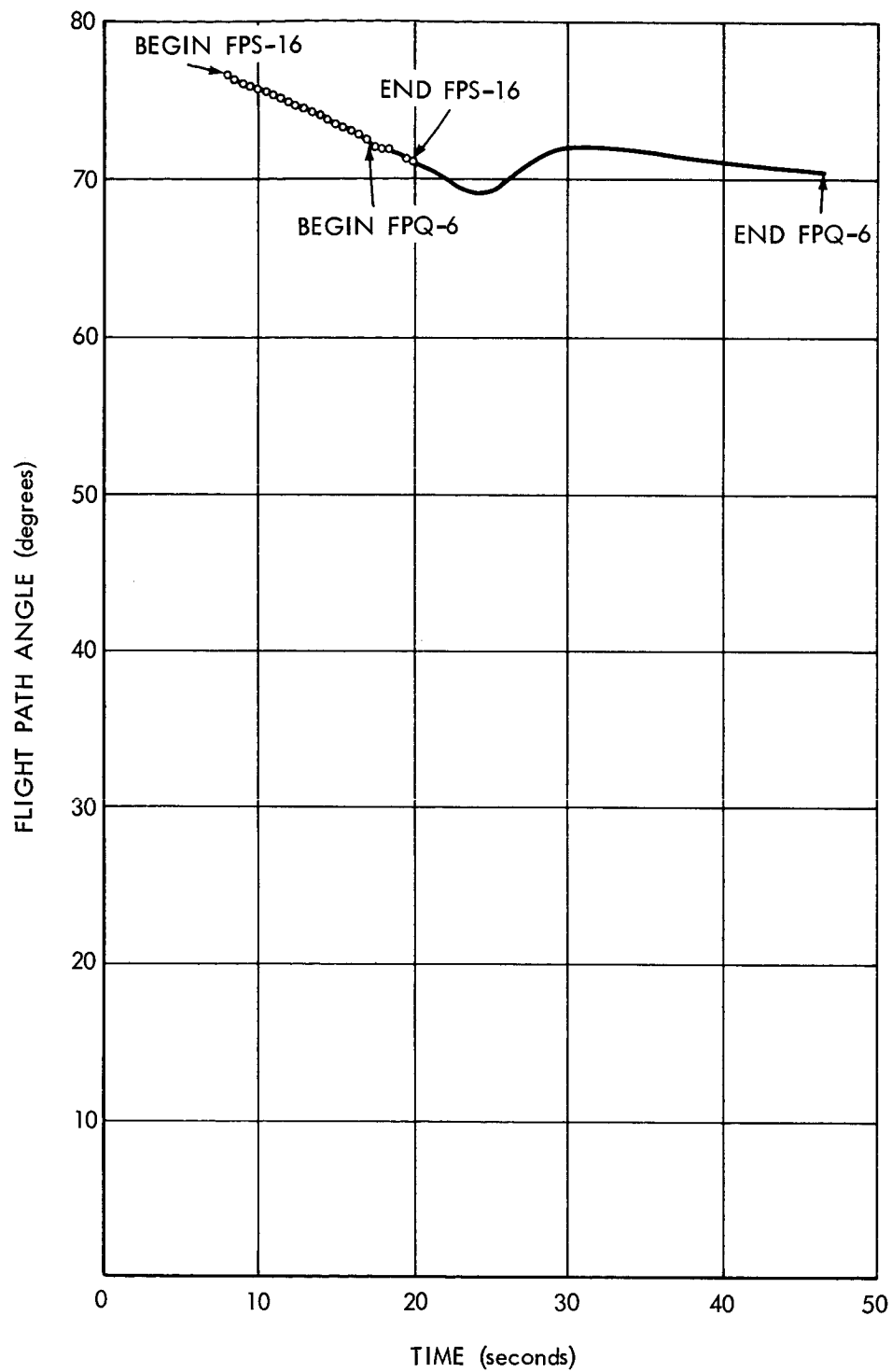


Figure 34. 14.61 UE Radar Plot, Flight Path Angle vs Time

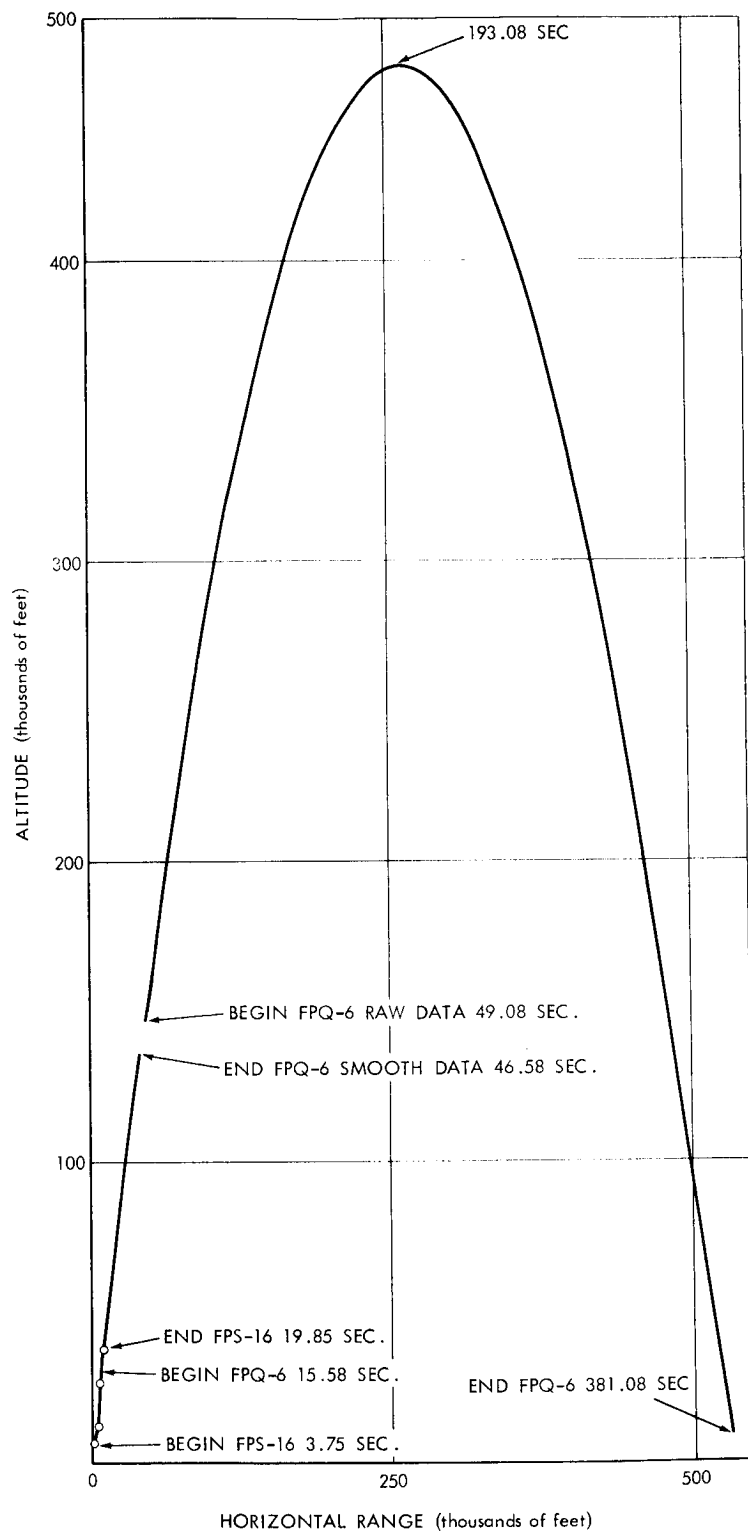


Figure 35. 14.61 UE Radar Plot, Altitude vs Horizontal Range

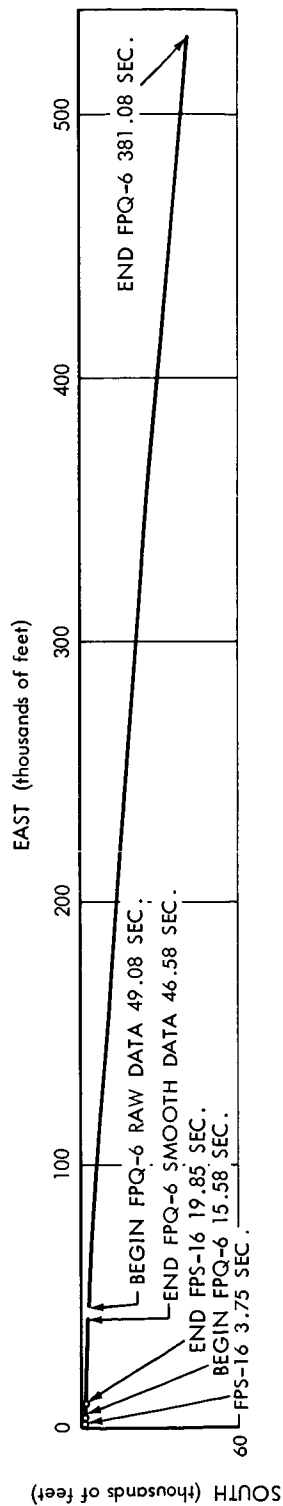


Figure 36. 14.61 UE Radar Plot, South Range vs East Range

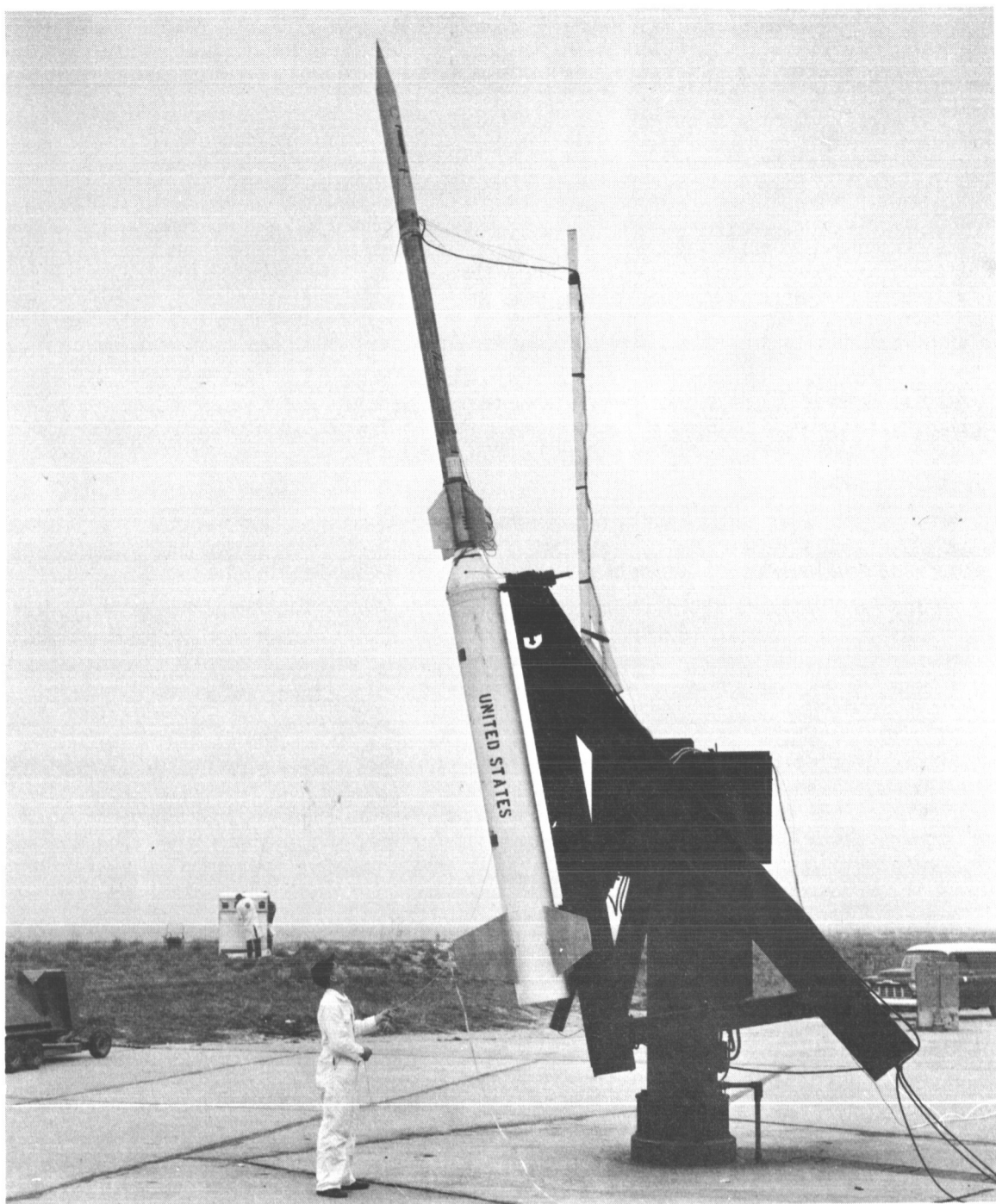


Figure 37. 14.62 UA Photograph



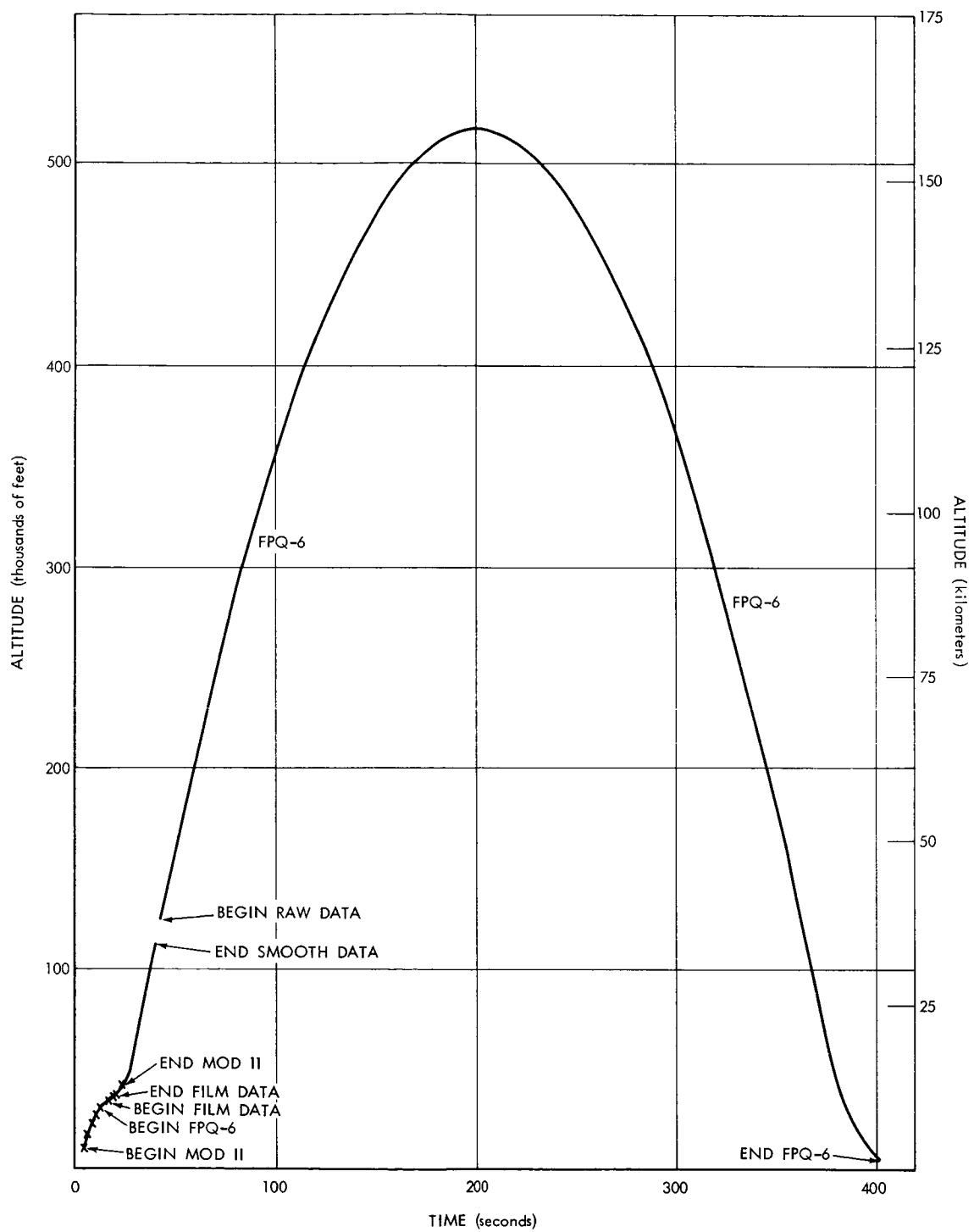


Figure 38. 14.62 UA Radar Plot, Altitude vs Time

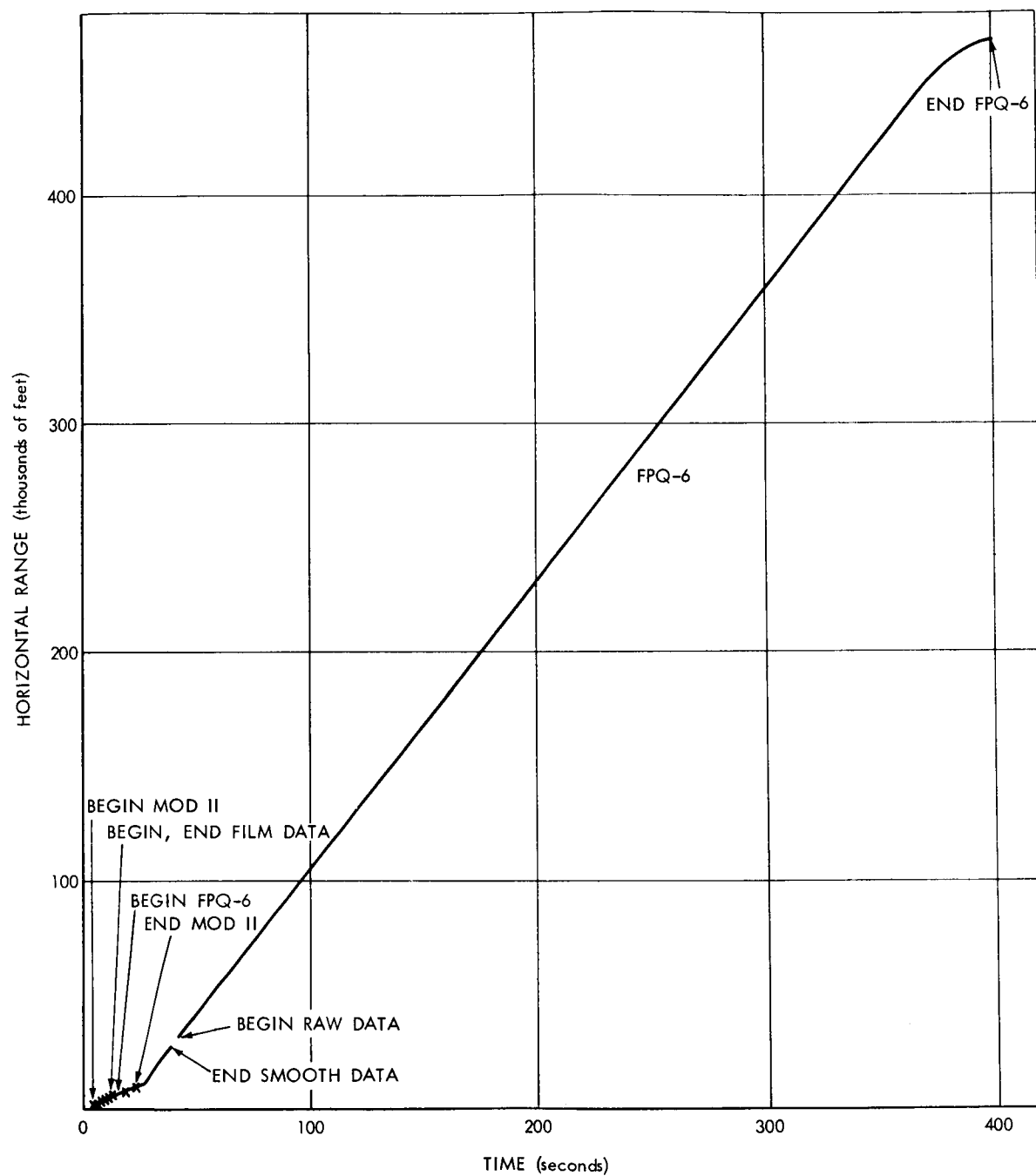


Figure 39. 14.62 UA Radar Plot, Horizontal Range vs Time

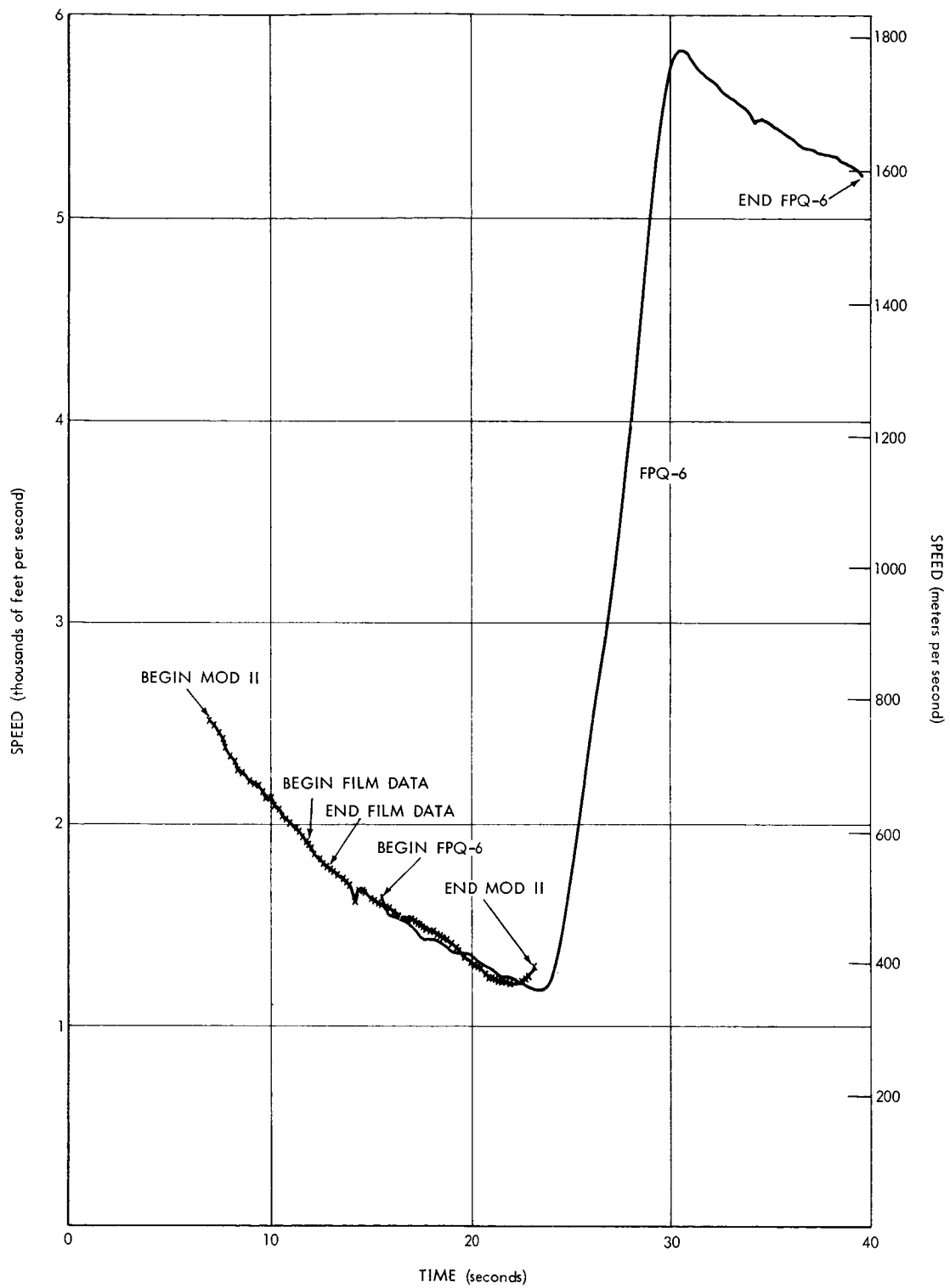


Figure 40. 14.62 UA Radar Plot, Speed vs Time

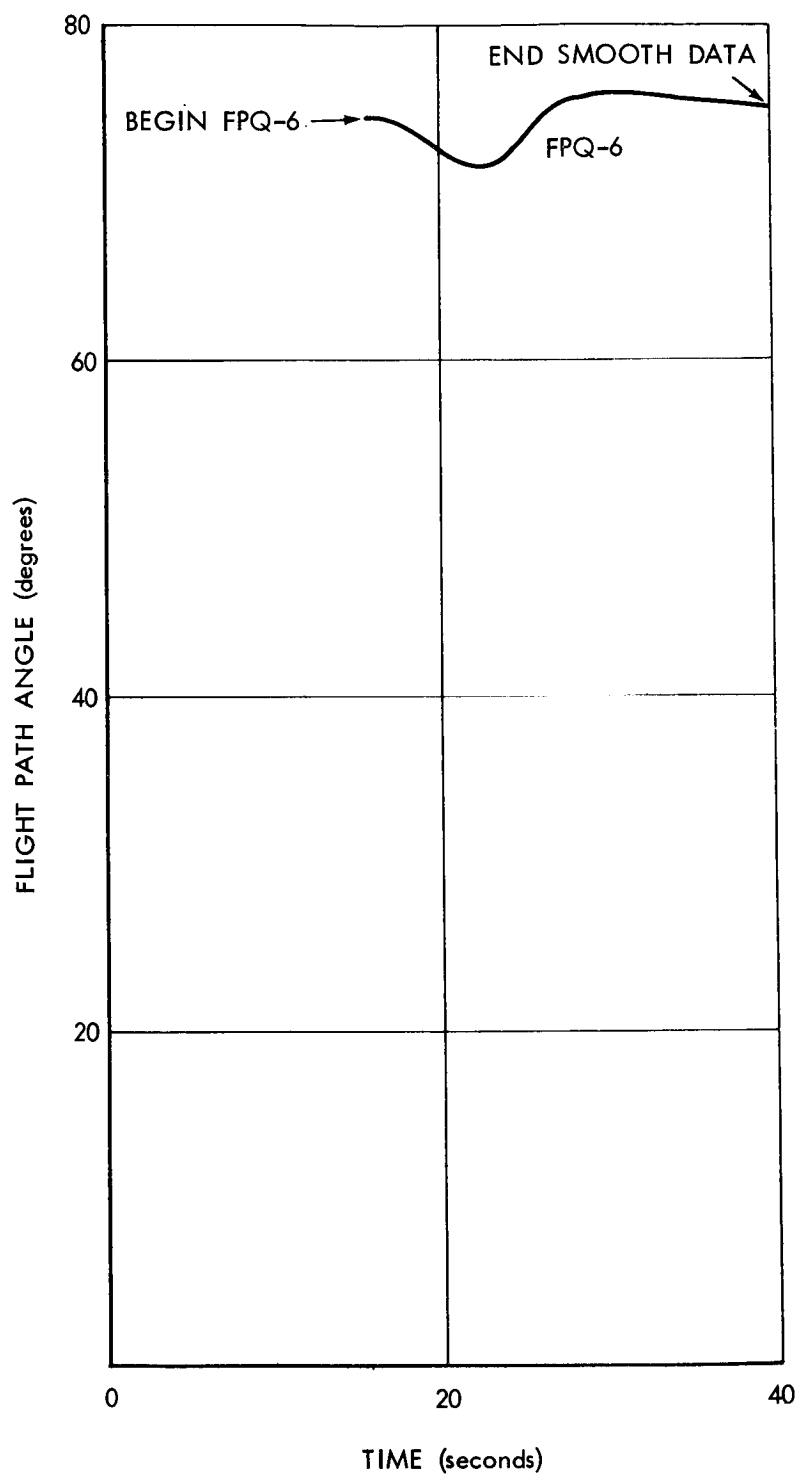


Figure 41. 14.62 UA Radar Plot, Flight Path Angle vs Time

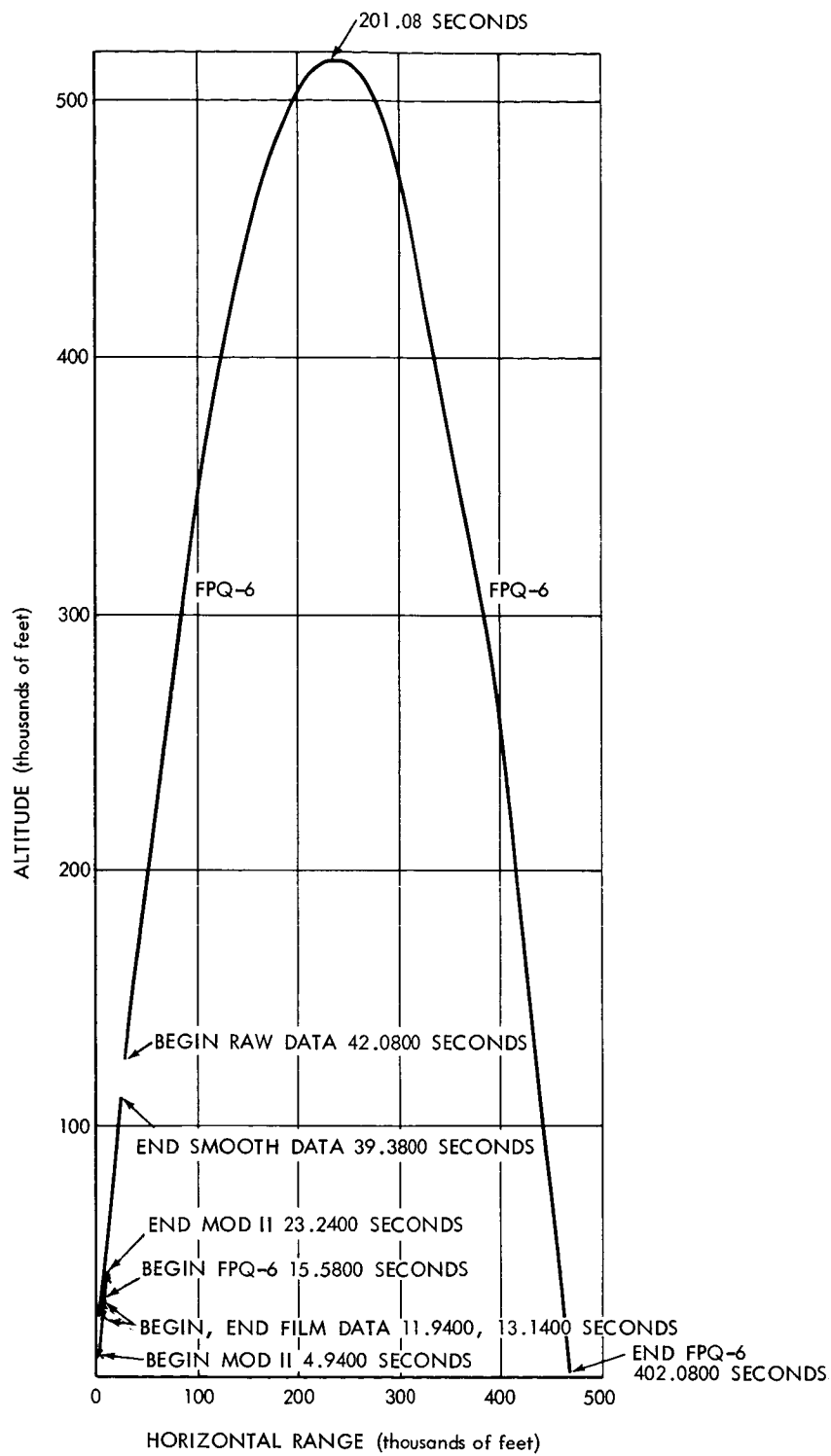


Figure 42. 14.62 UA Radar Plot, Altitude vs Horizontal Range

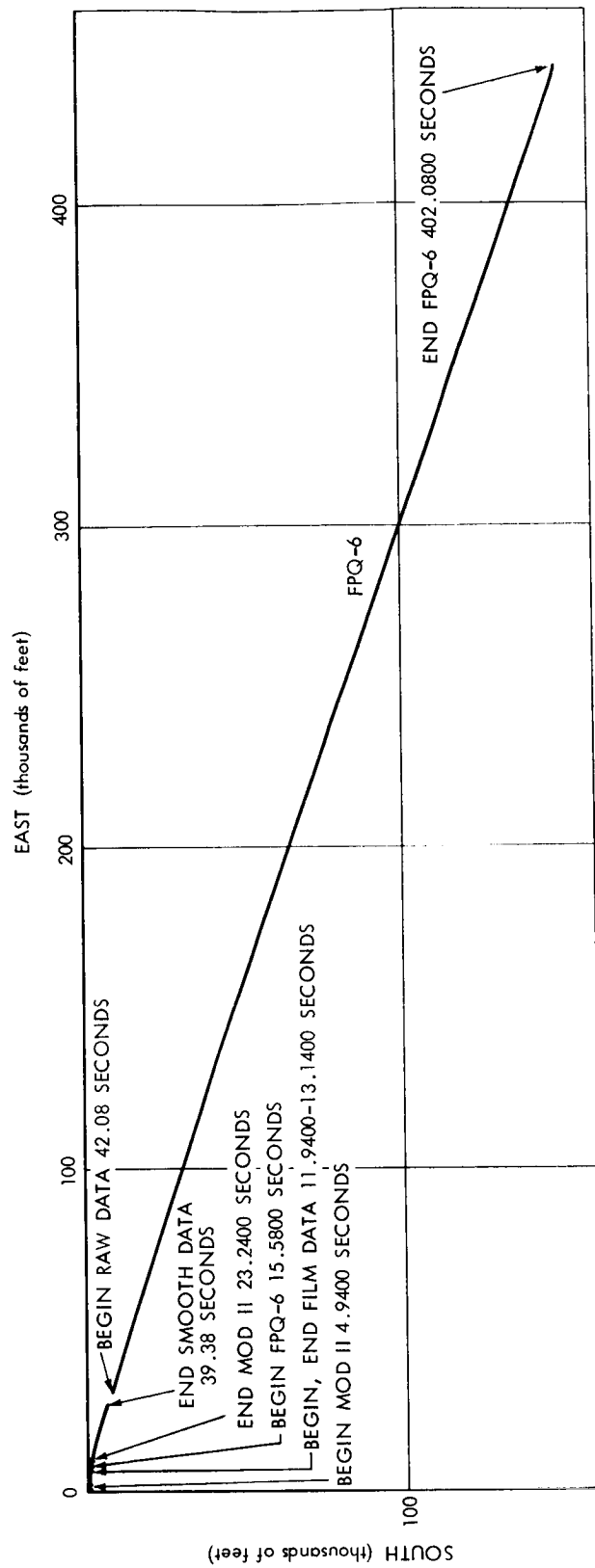


Figure 43. 14.62 UA Radar Plot, South Range vs East Range

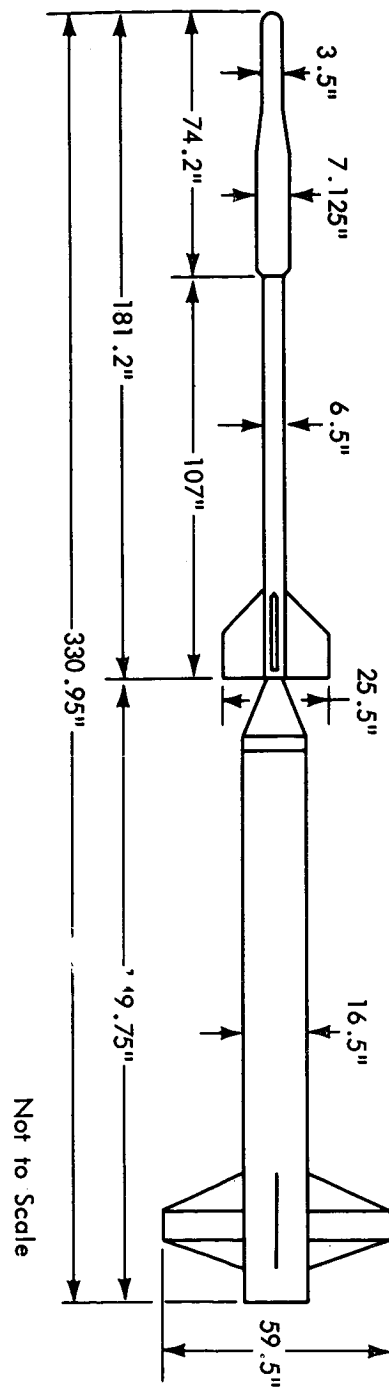


Figure 44. 14.64 UA Sketch

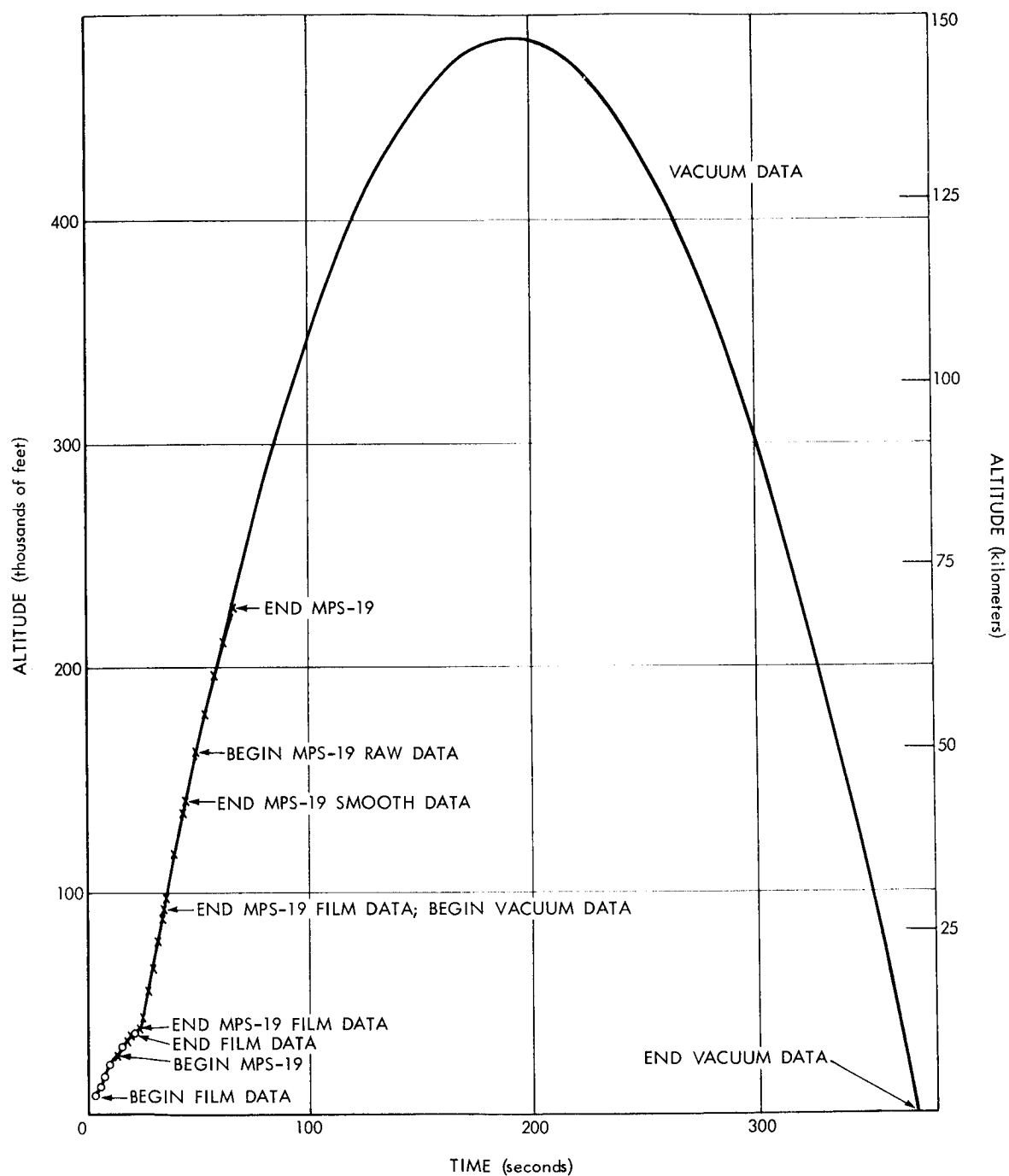


Figure 45. 14.64 UA Radar Plot, Altitude vs Time



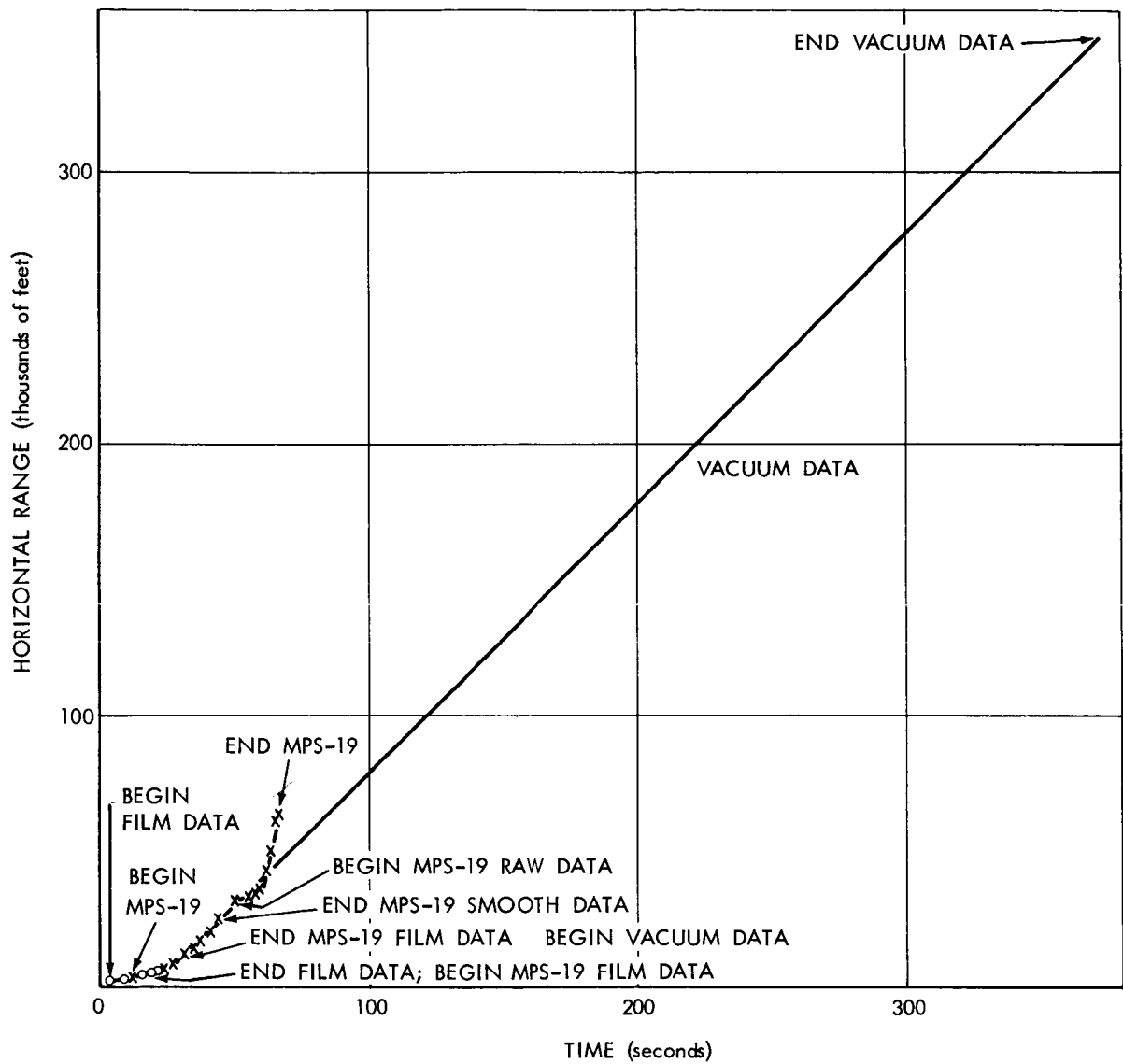


Figure 46. 14.64 UA Radar Plot, Horizontal Range vs Time

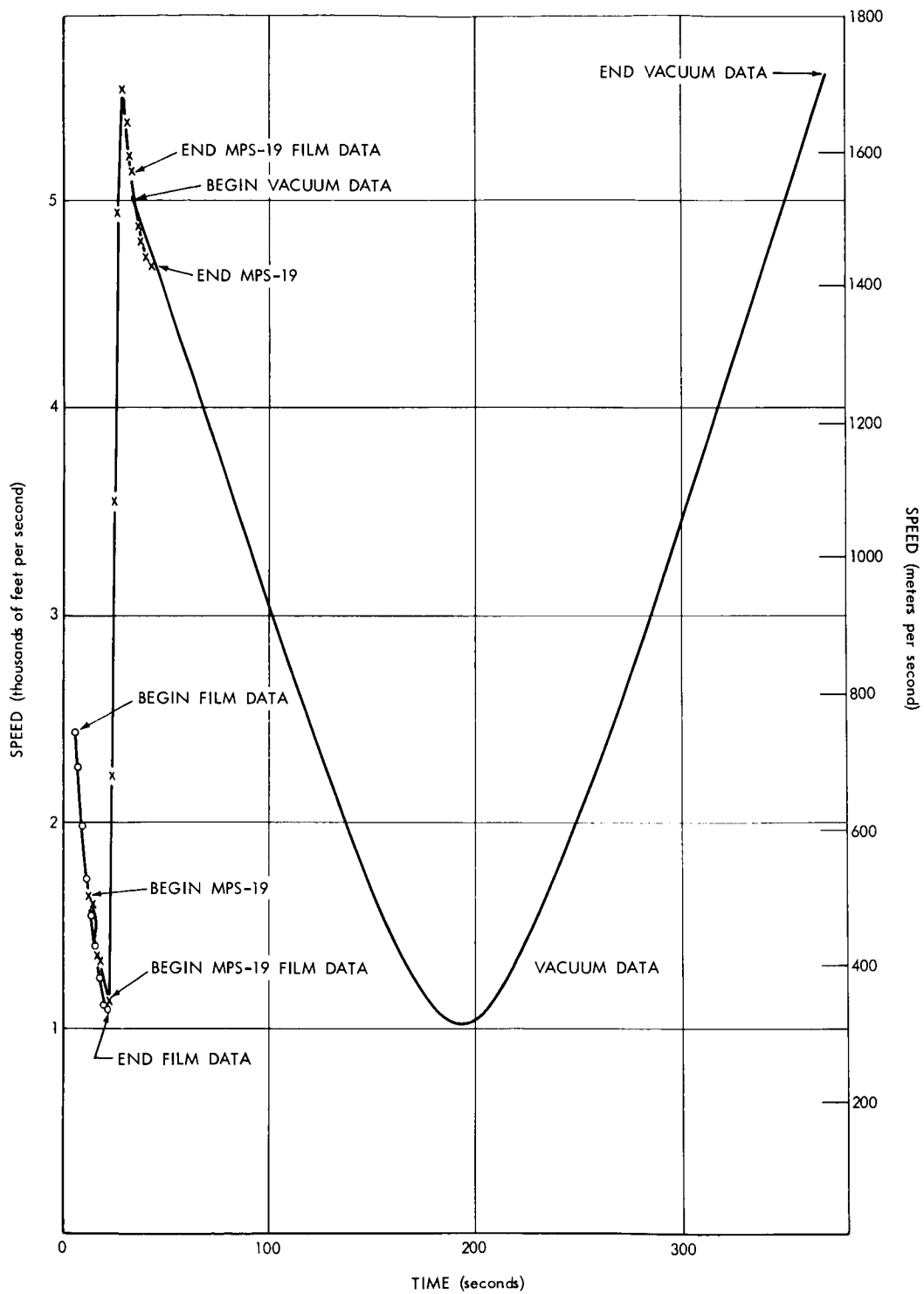


Figure 47. 14.64 UA Radar Plot, Speed vs Time

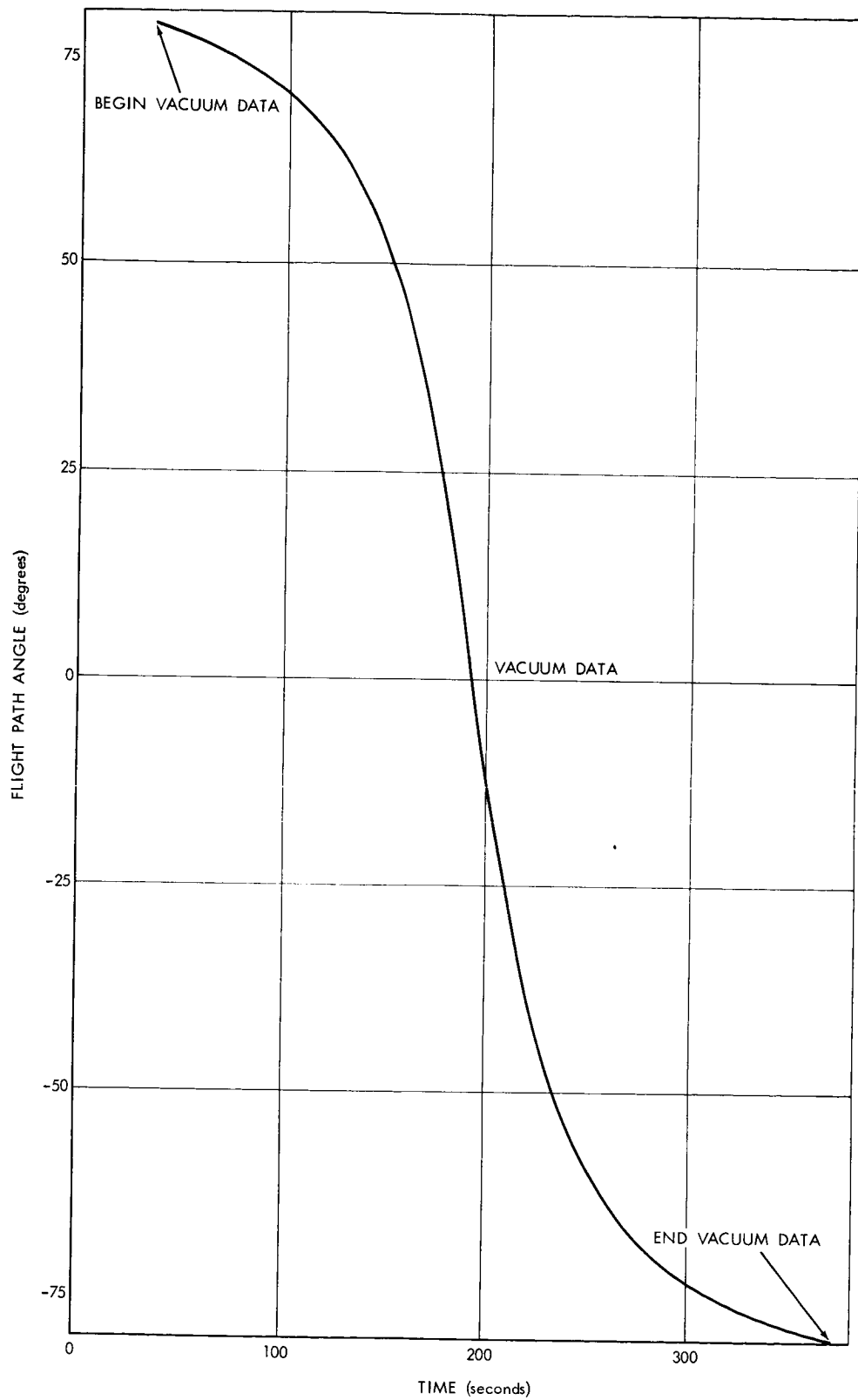


Figure 48. 14.64 UA Radar Plot, Flight Path Angle vs Time

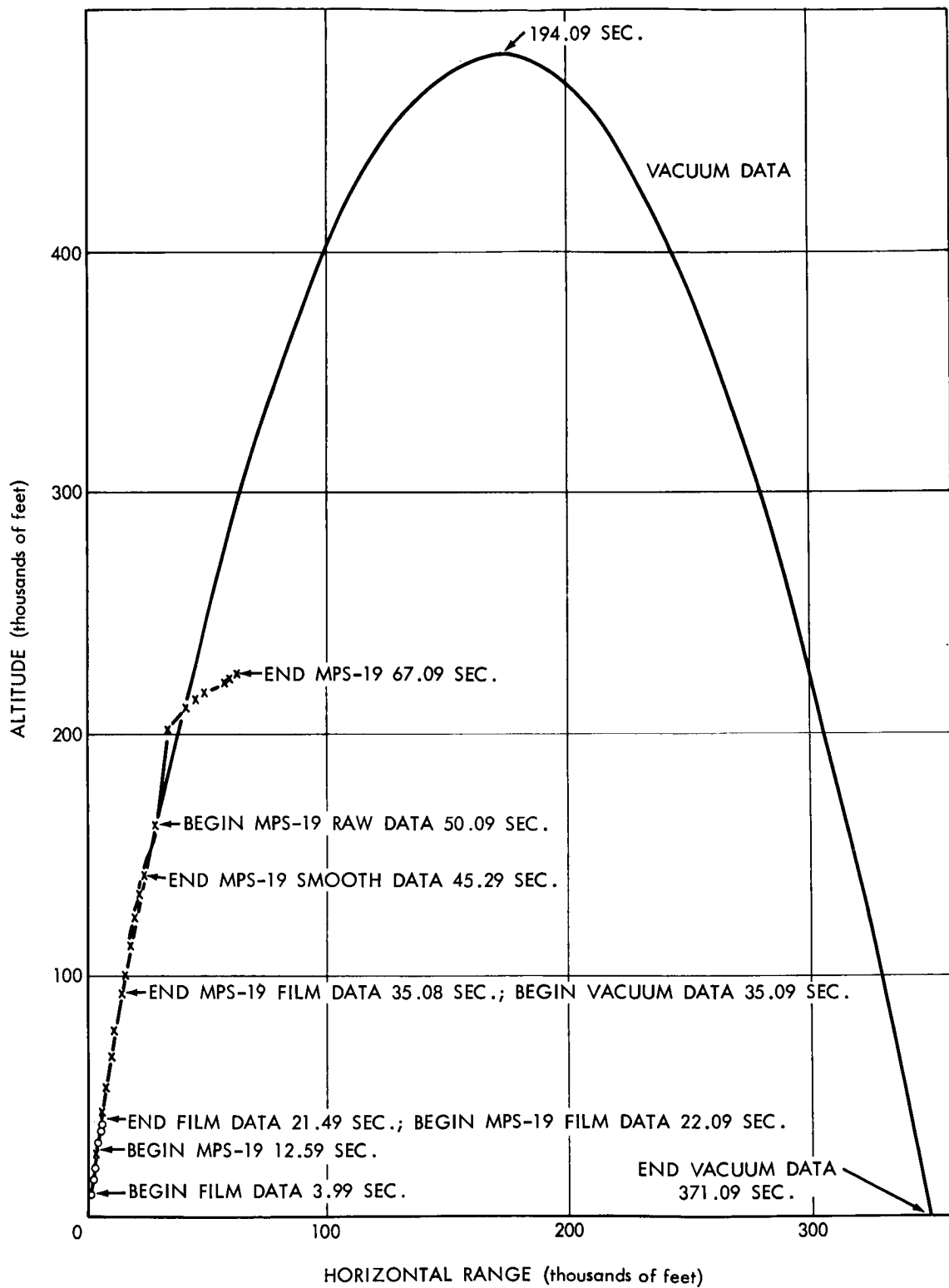


Figure 49. 14.64 UA Radar Plot, Altitude vs Horizontal Range

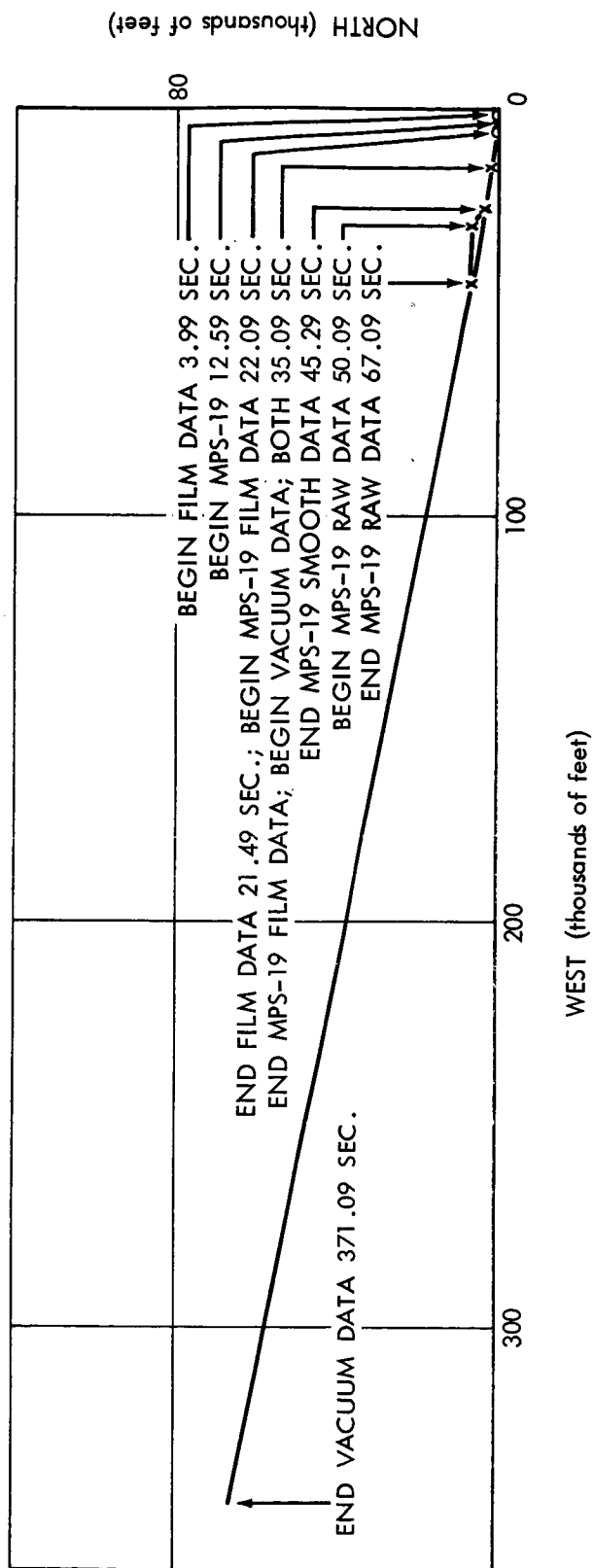


Figure 50. 14.64 UA Radar Plot, North Range vs West Range

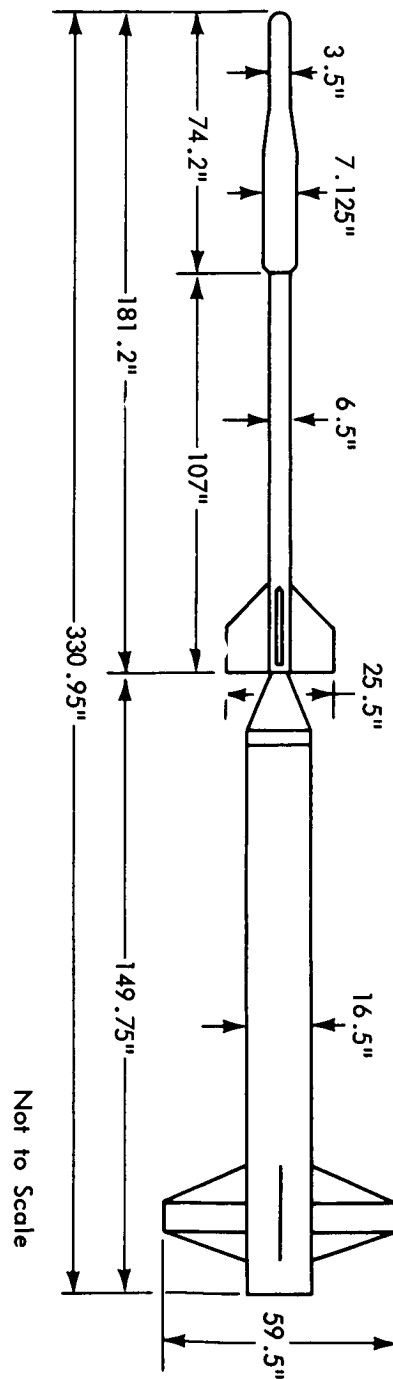


Figure 51. 14.65 UA Sketch

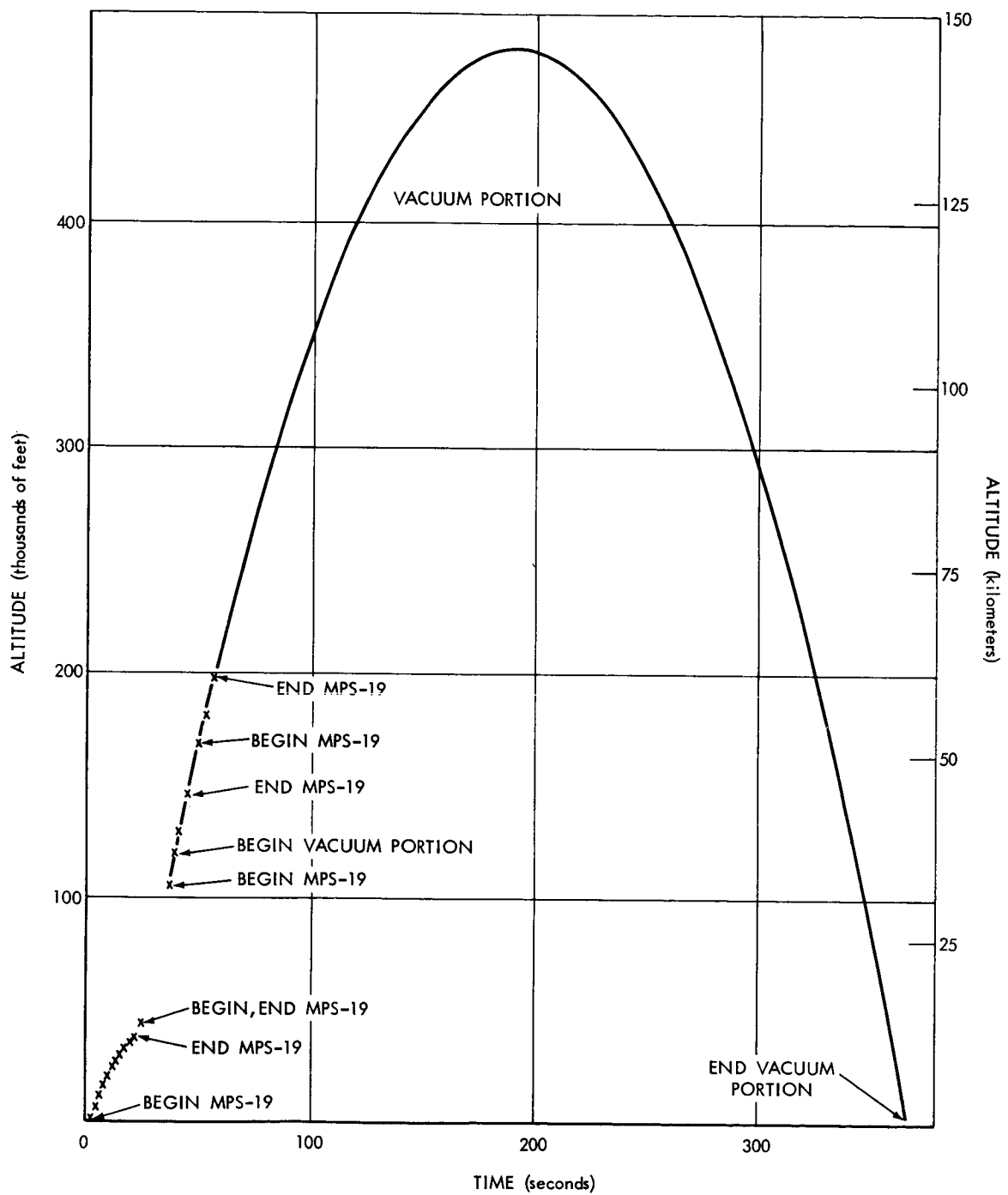


Figure 52. 14.65 UA Radar Plot, Altitude vs Time

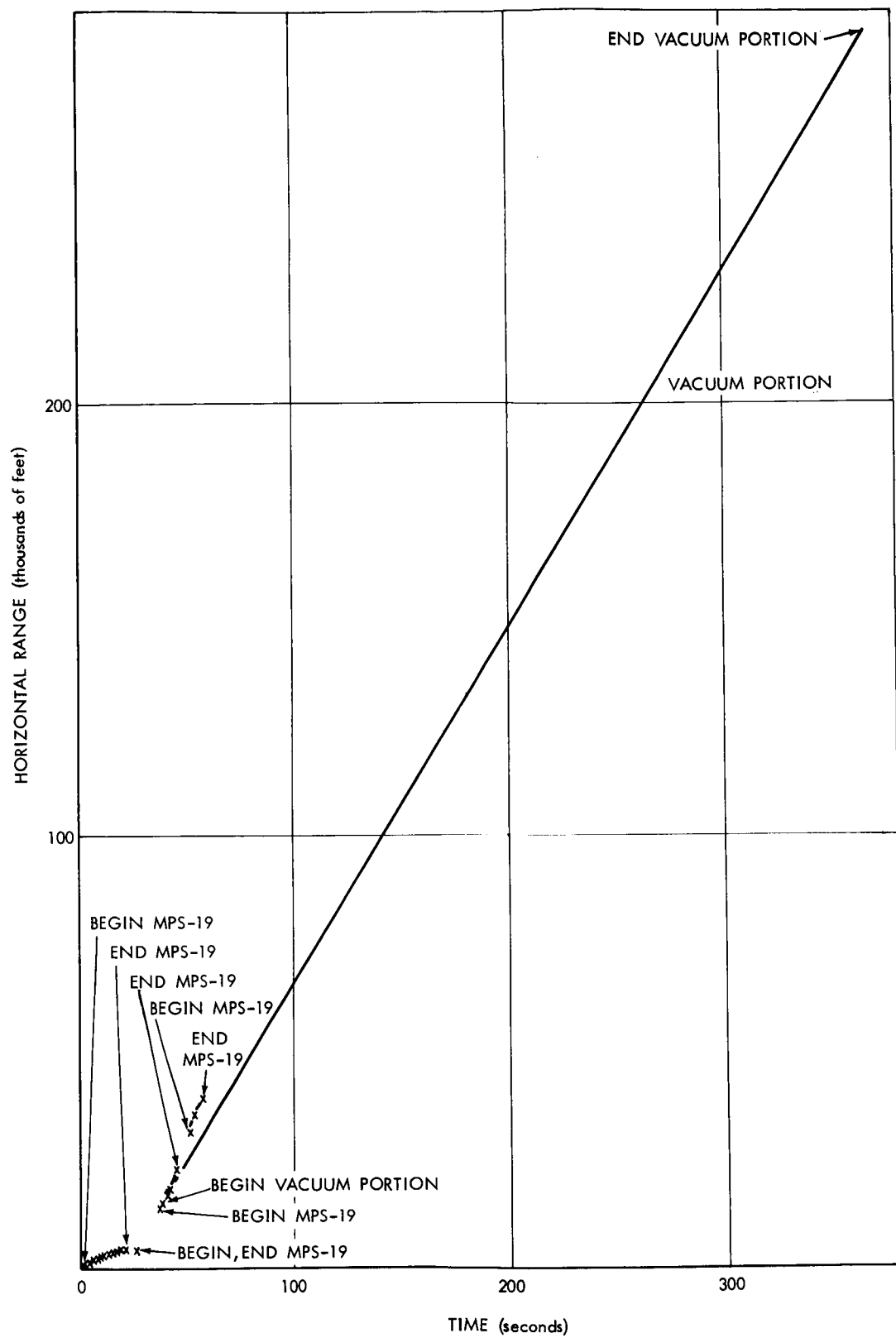


Figure 53. 14.65 UA Radar Plot, Horizontal Range vs Time



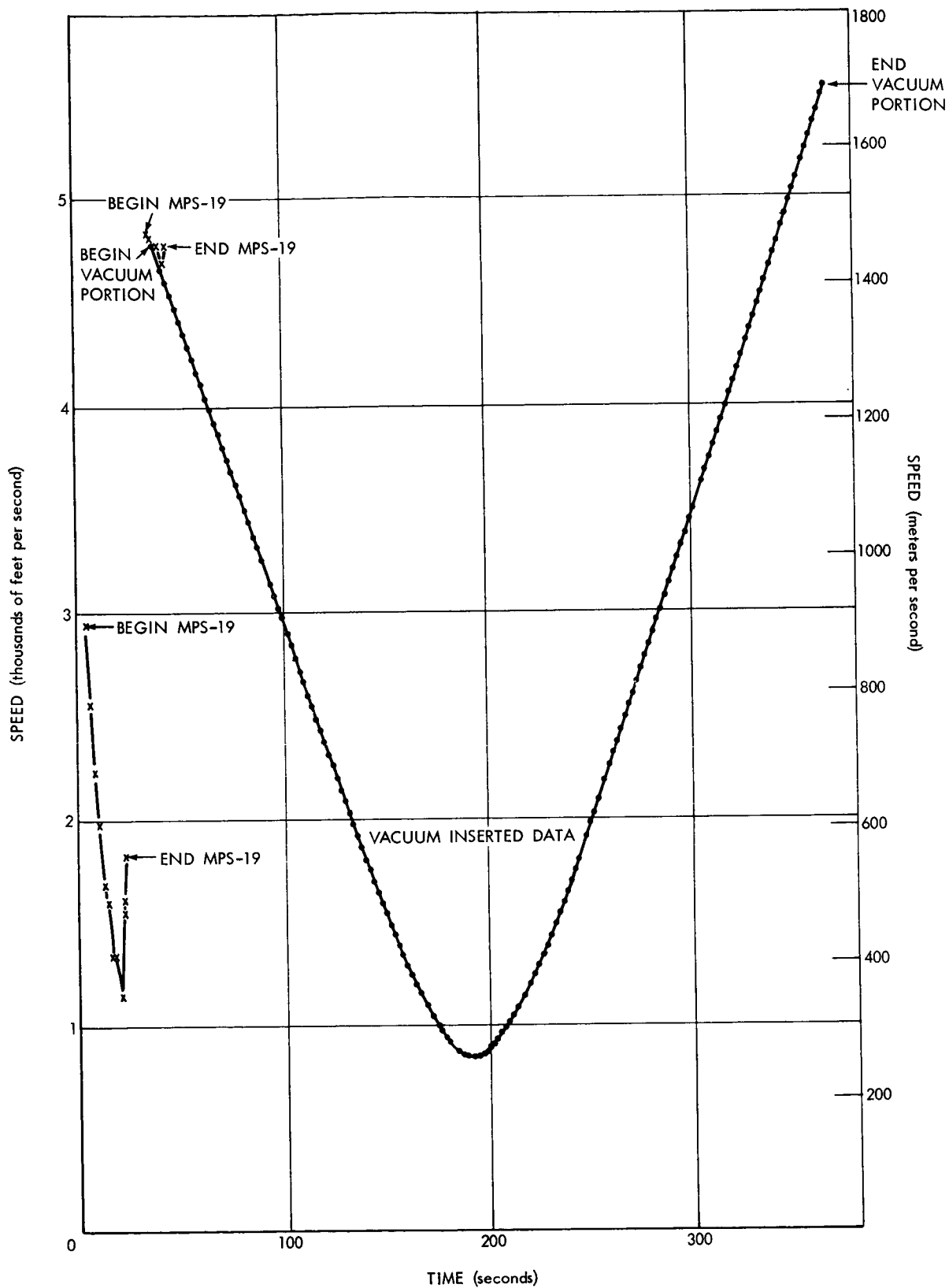


Figure 54. 14.65 UA Radar Plot, Speed vs Time

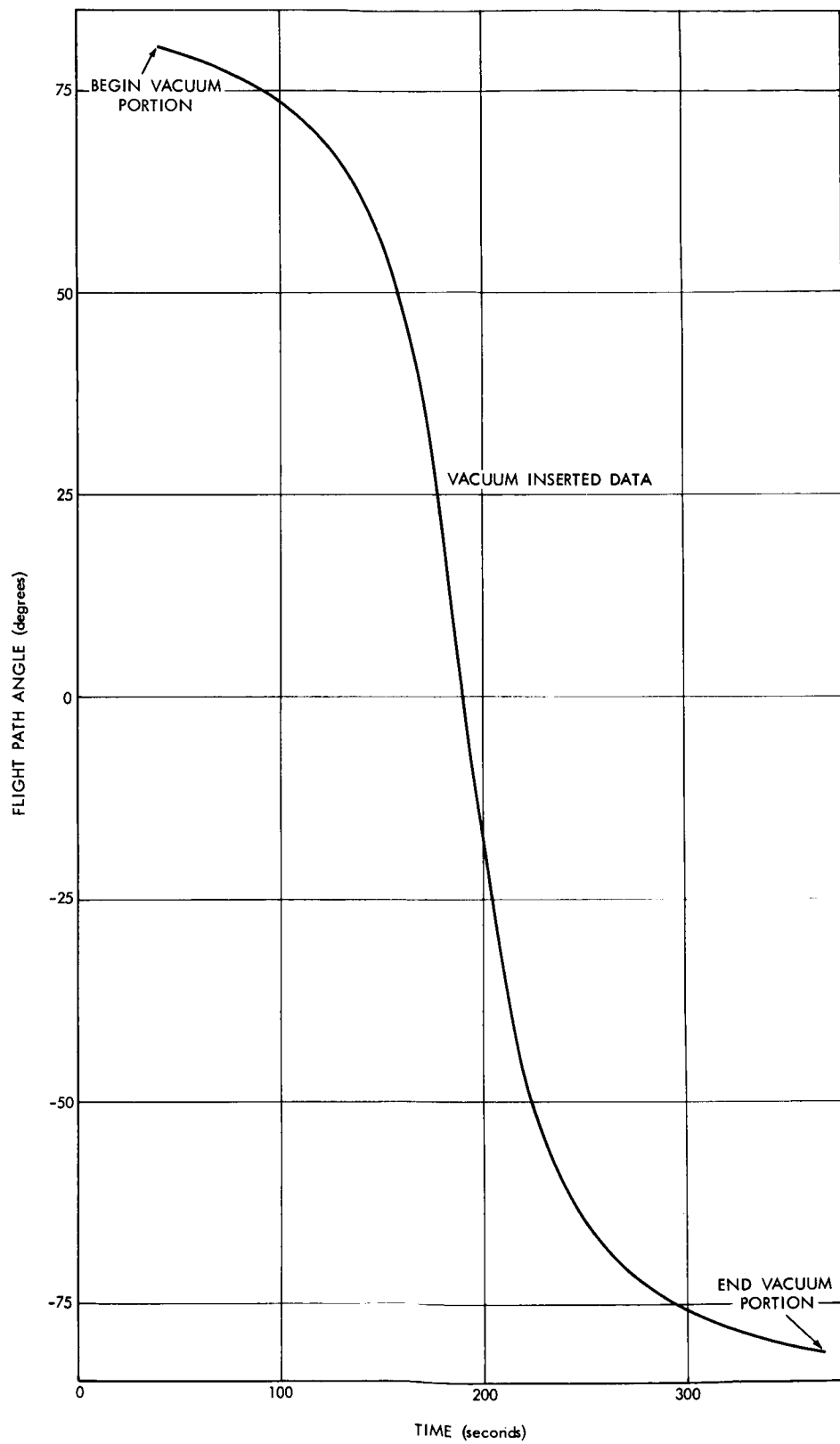


Figure 55. 14.65 UA Radar Plot, Flight Path Angle vs Time

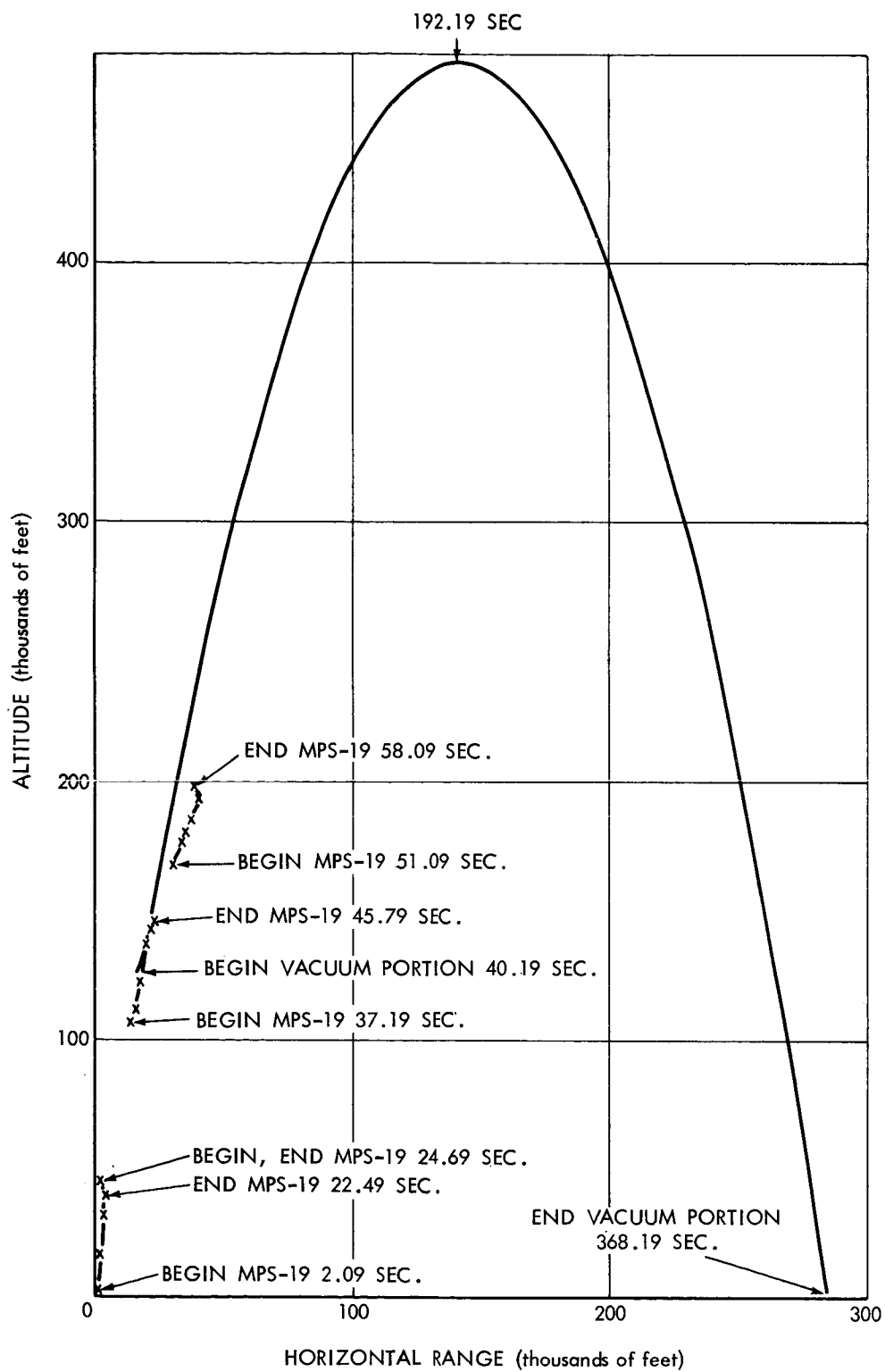


Figure 56. 14.65 UA Radar Plot, Altitude vs Horizontal Range

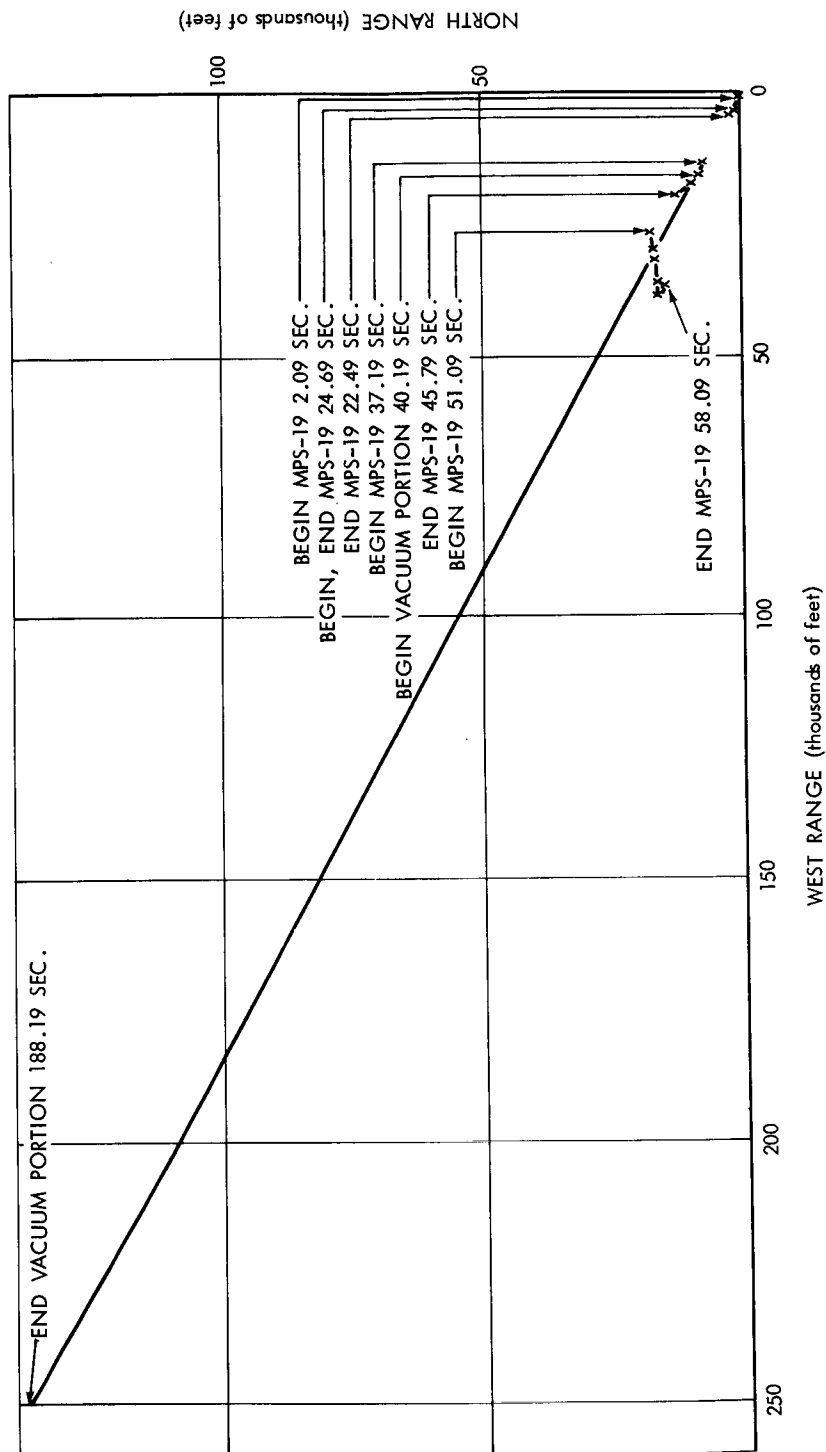


Figure 57. 14.65 UA Radar Plot, North Range vs West Range

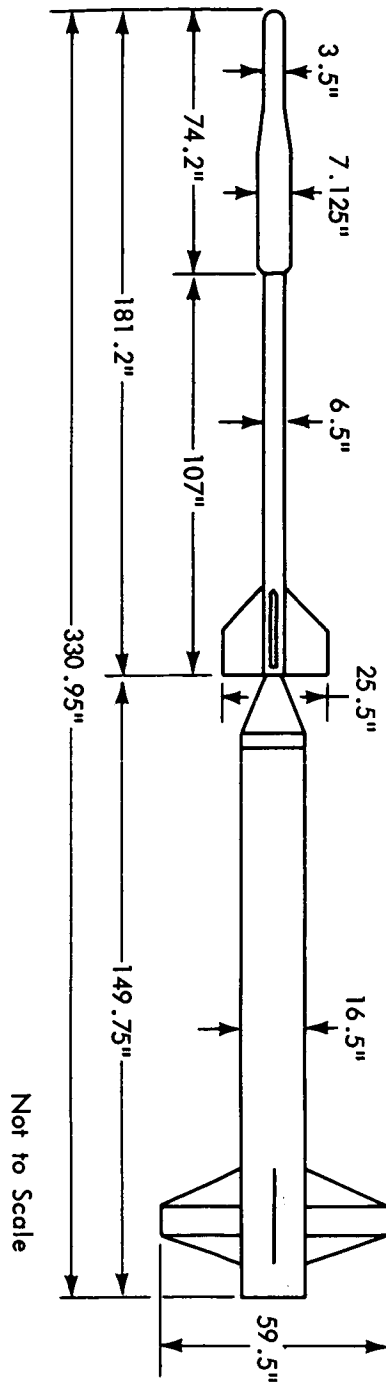


Figure 58. 14.66 UA Sketch

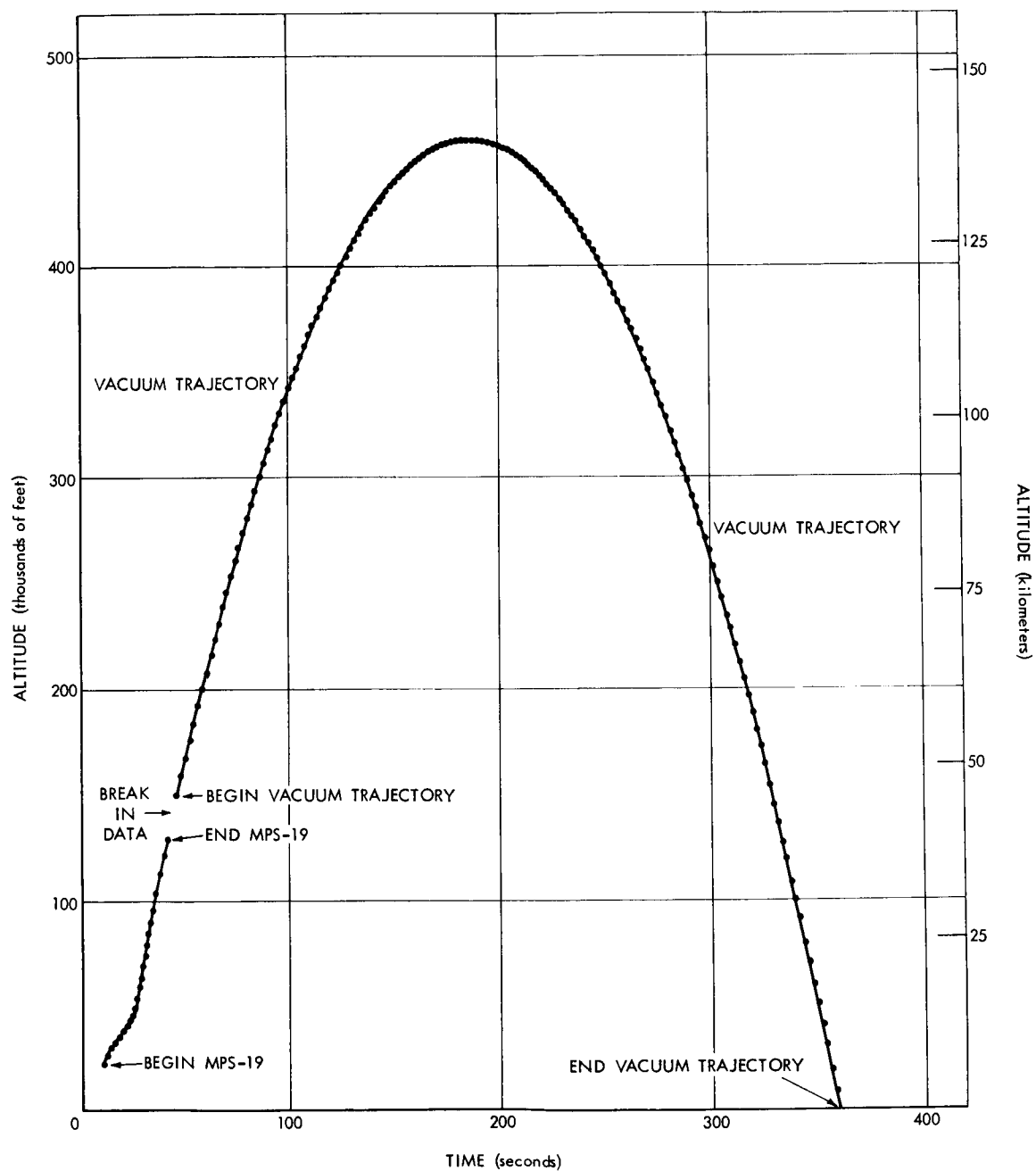


Figure 59. 14.66 UA Radar Plot, Altitude vs Time

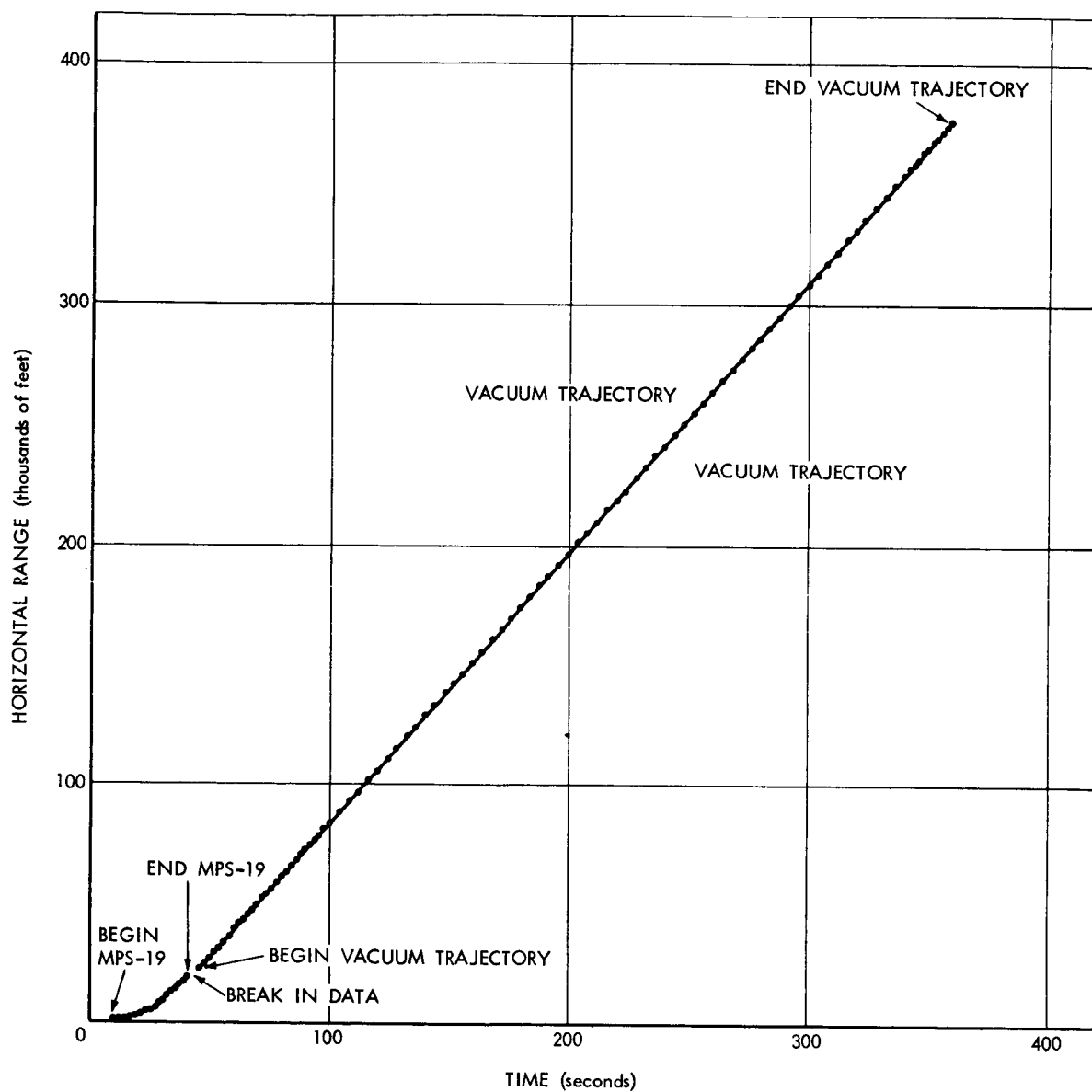


Figure 60. 14.66 UA Radar Plot, Horizontal Range vs Time

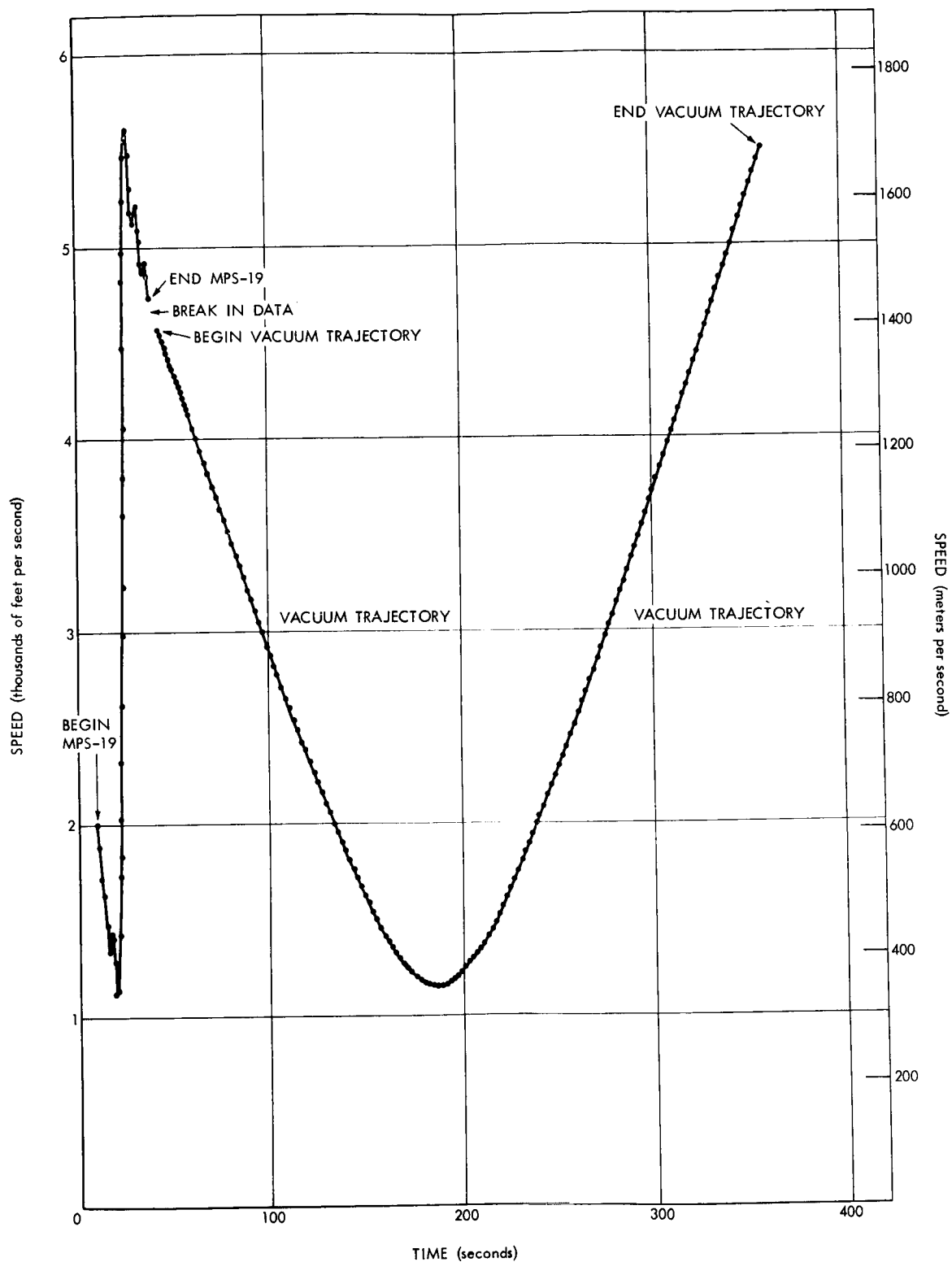


Figure 61. 14.66 UA Radar Plot, Speed vs Time



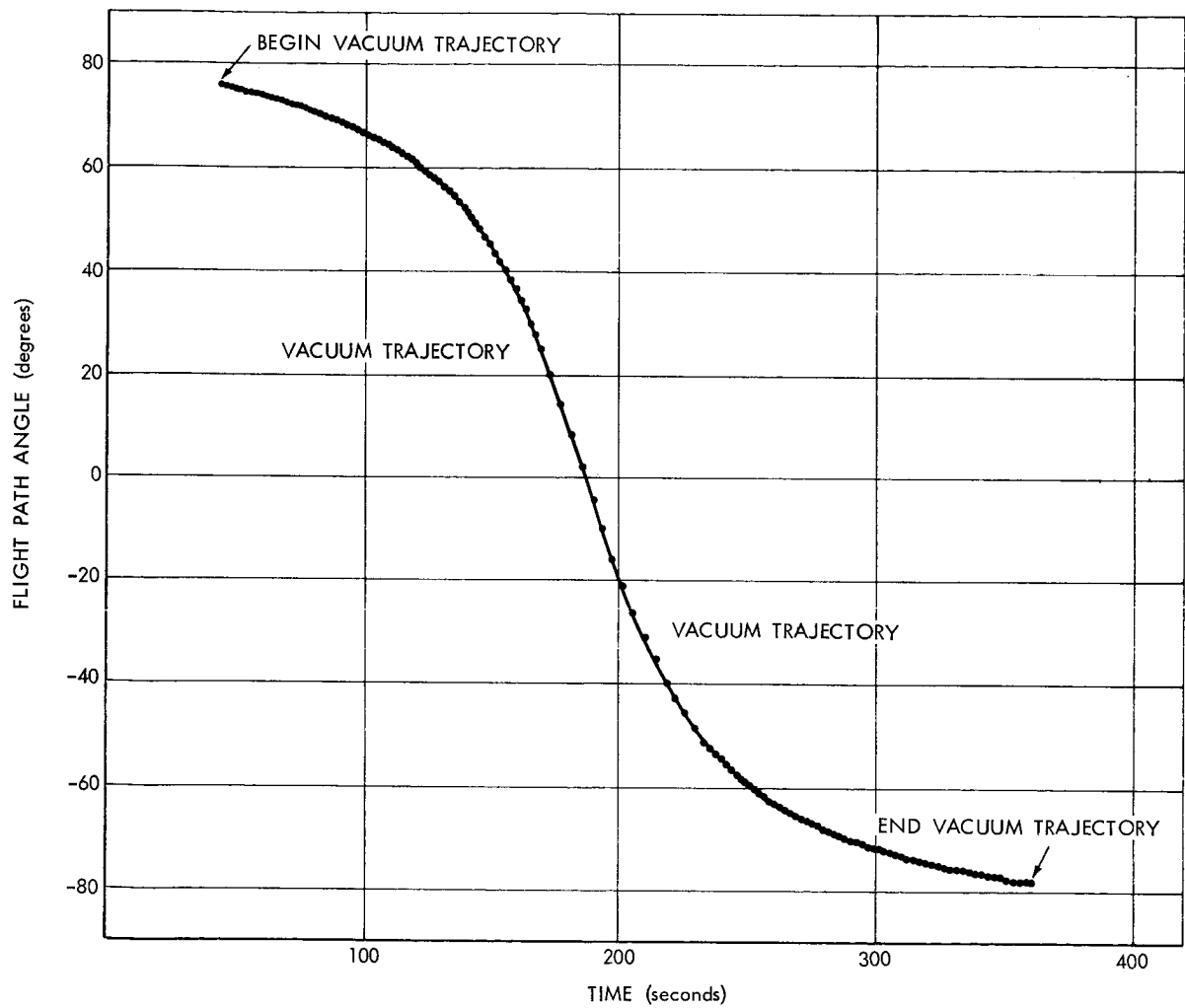


Figure 62. 14.66 UA Radar Plot, Flight Path Angle vs Time

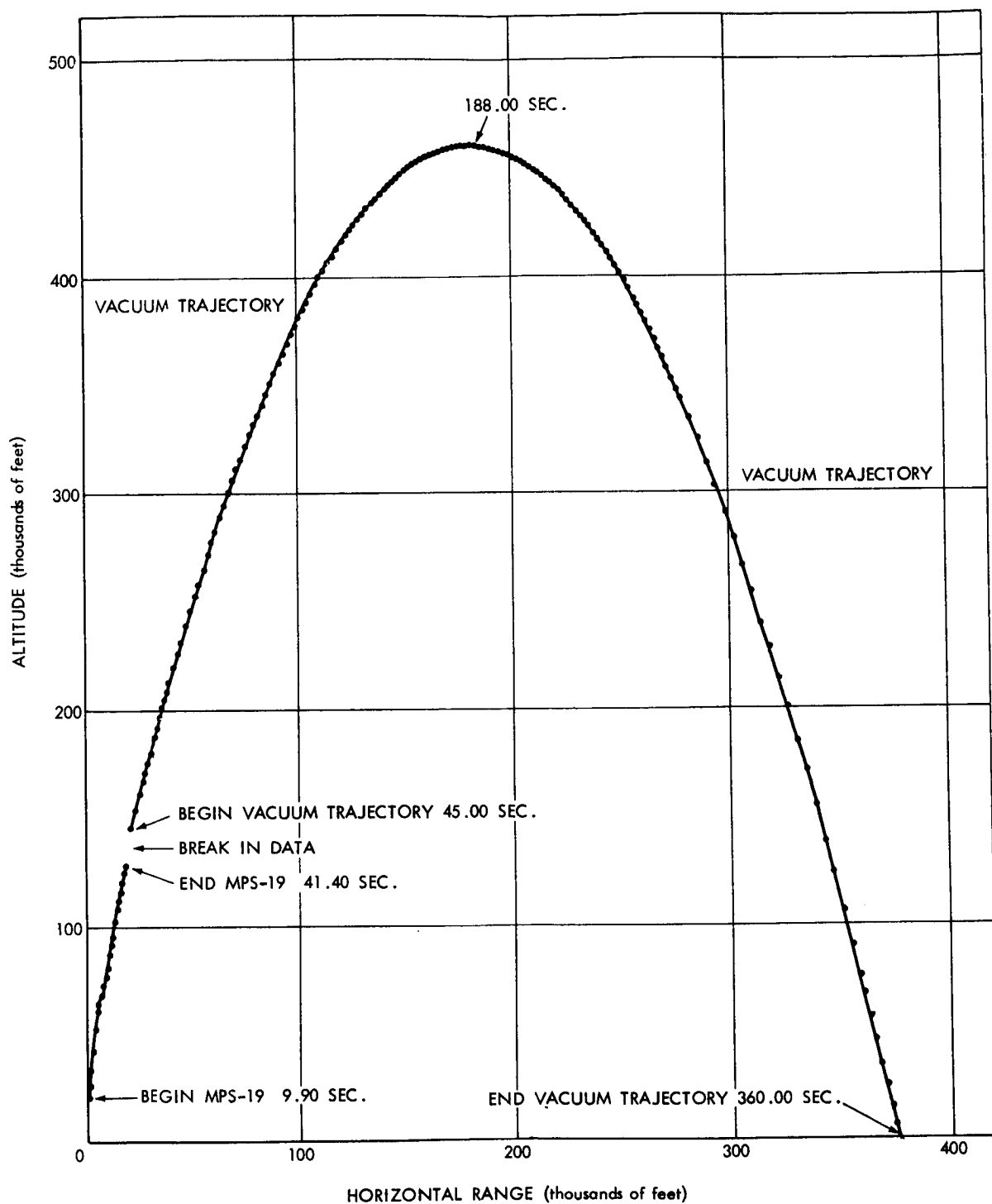


Figure 63. 14.66 UA Radar Plot, Altitude vs Horizontal Range

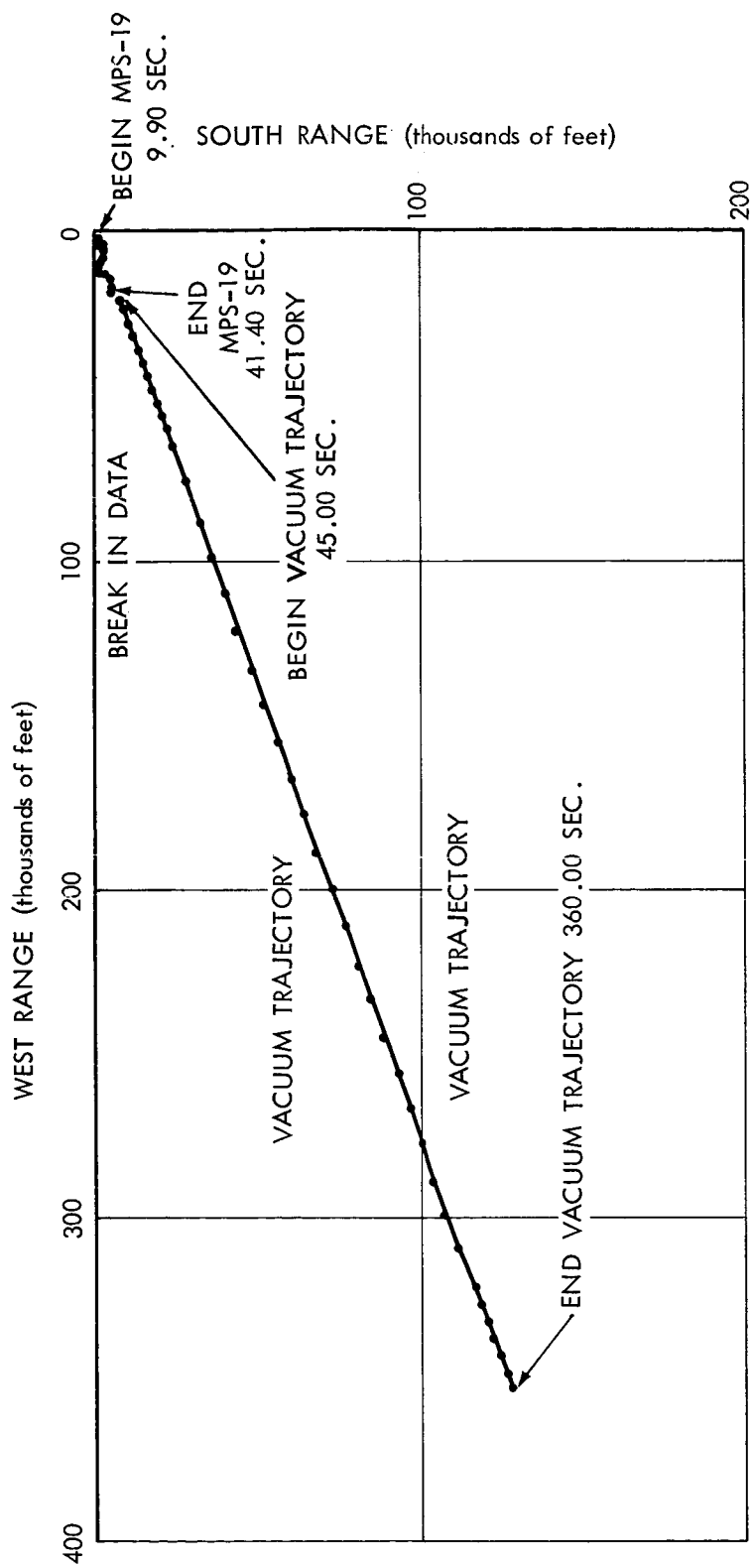


Figure 64. 14.66 UA Radar Plot, South Range vs West Range

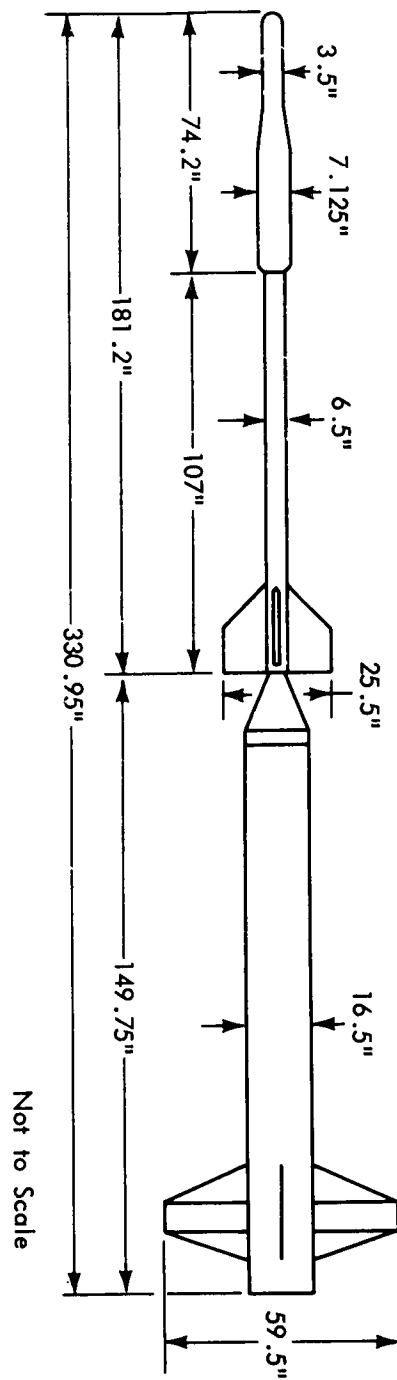


Figure 65. 14.67 Sketch

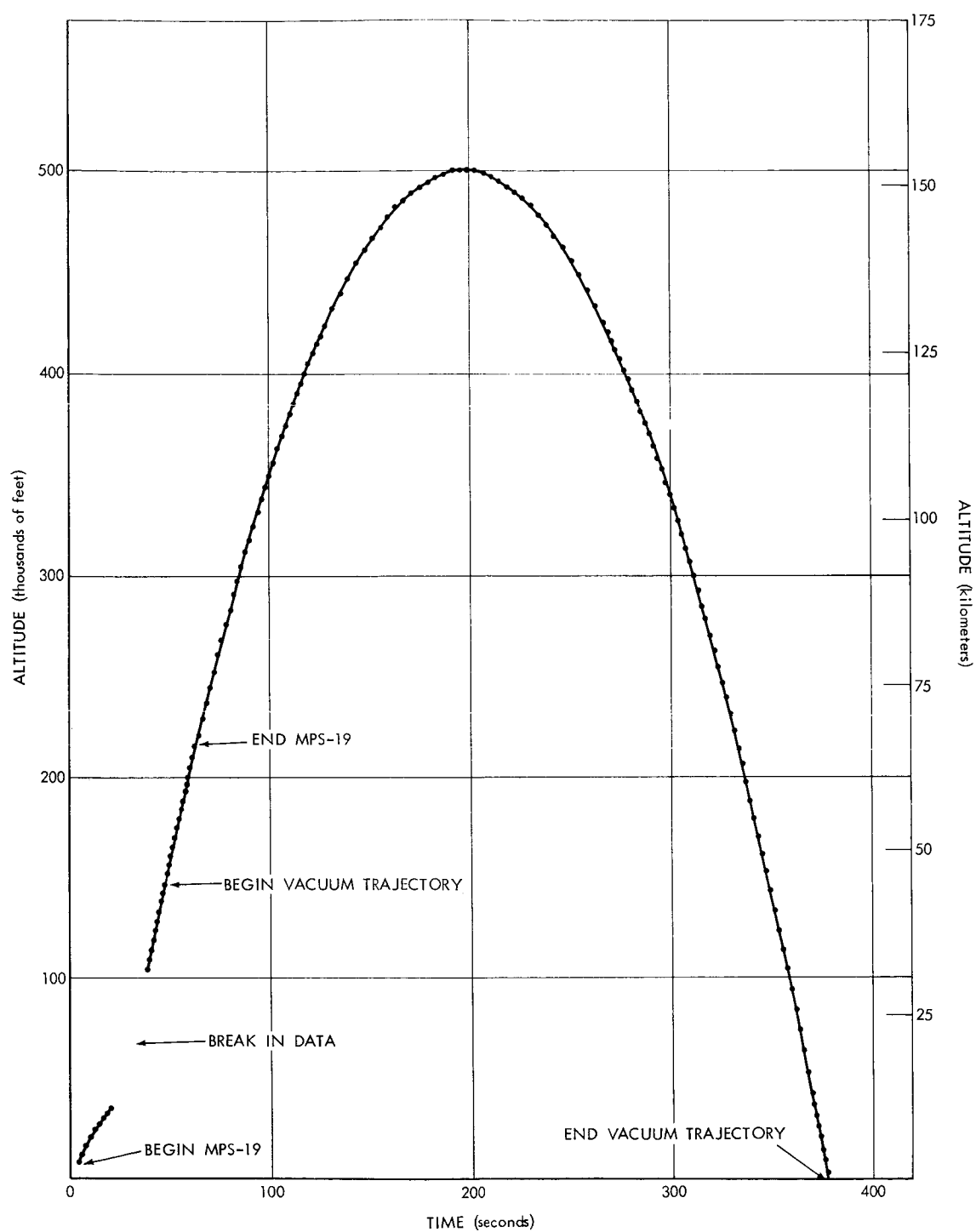


Figure 66. 14.67 UA Radar Plot, Altitude vs Time

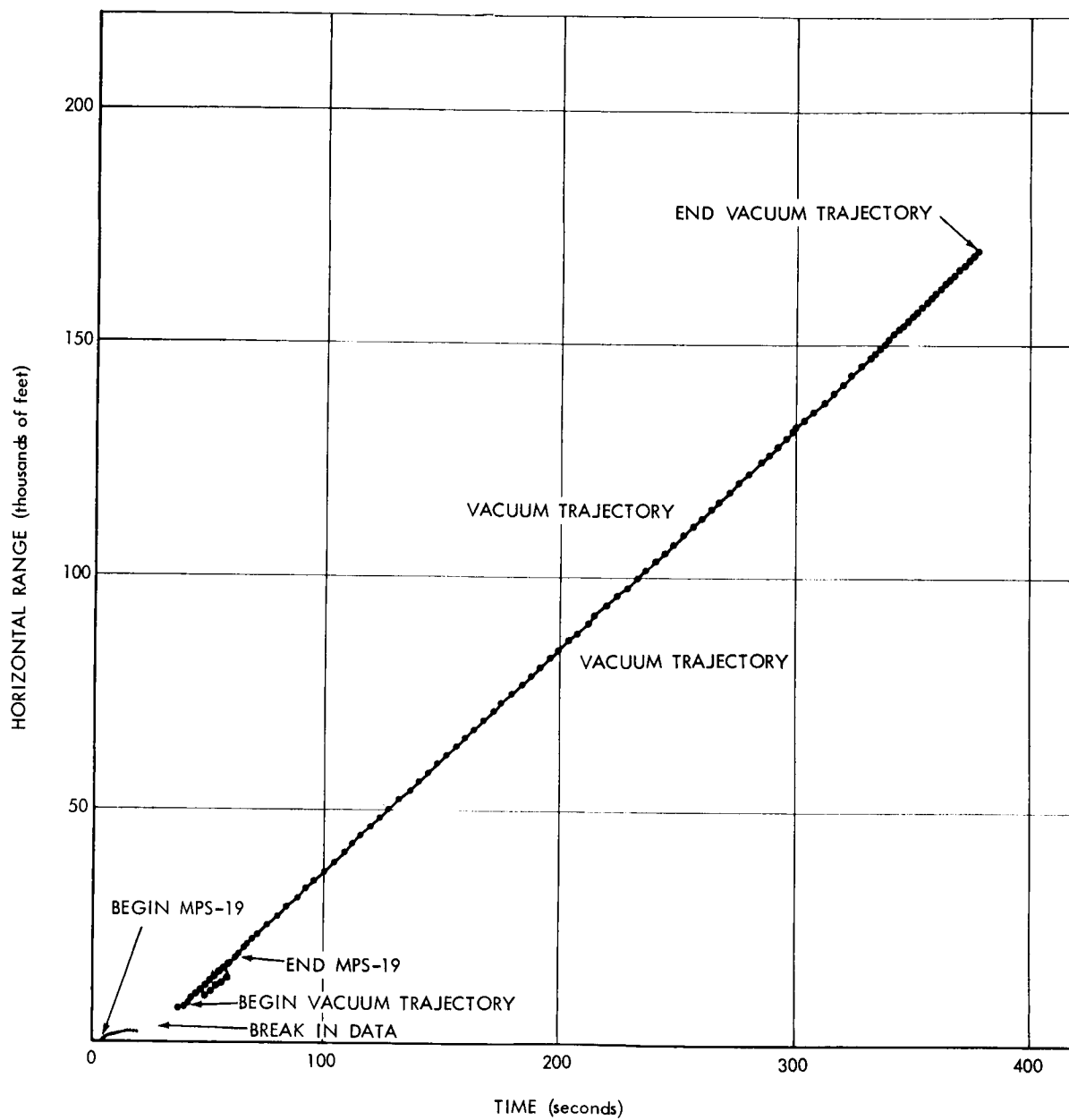


Figure 67. 14.67 UA Radar Plot, Horizontal Range vs Time

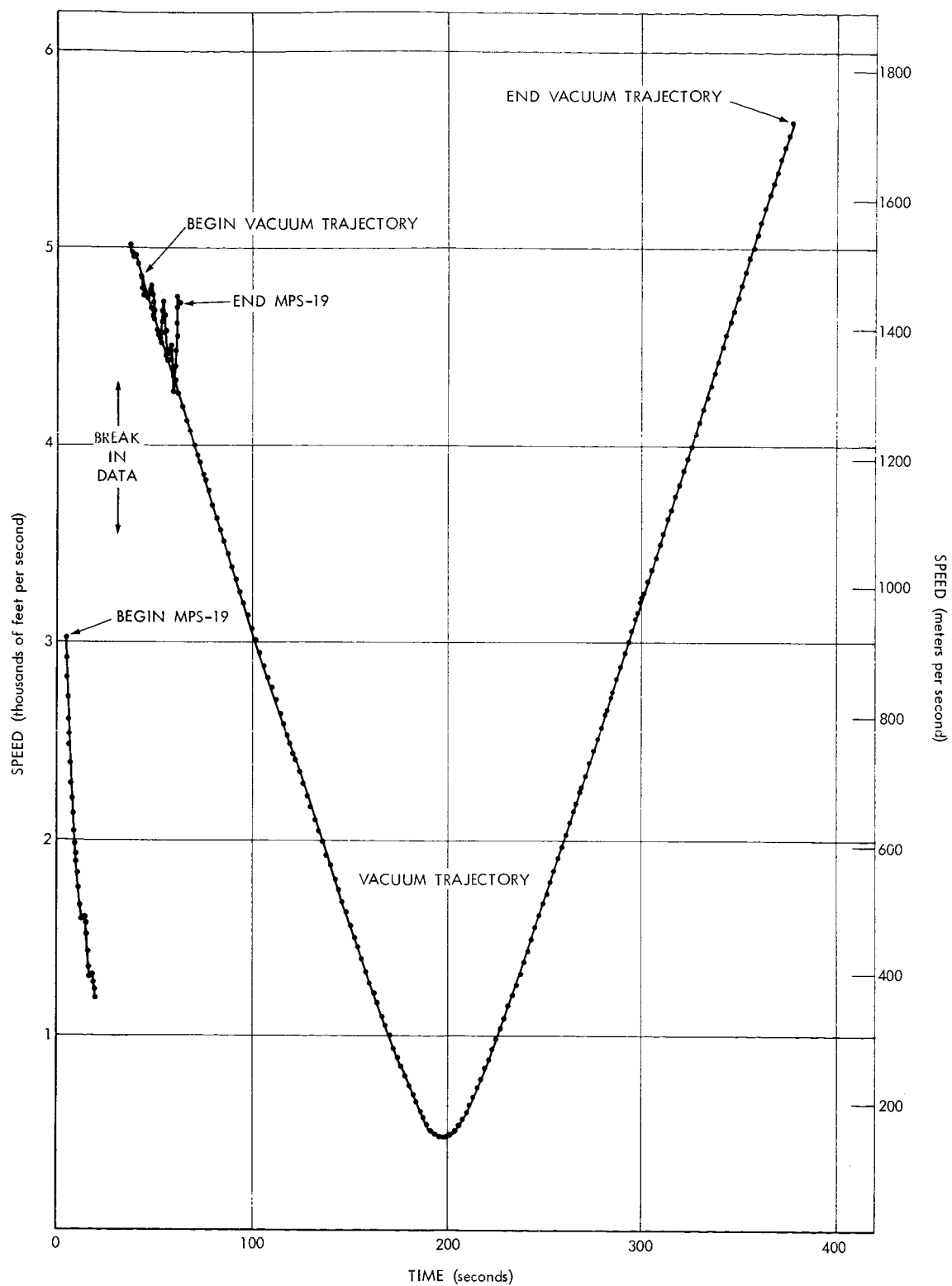


Figure 68. 14.67 UA Radar Plot, Speed vs Time

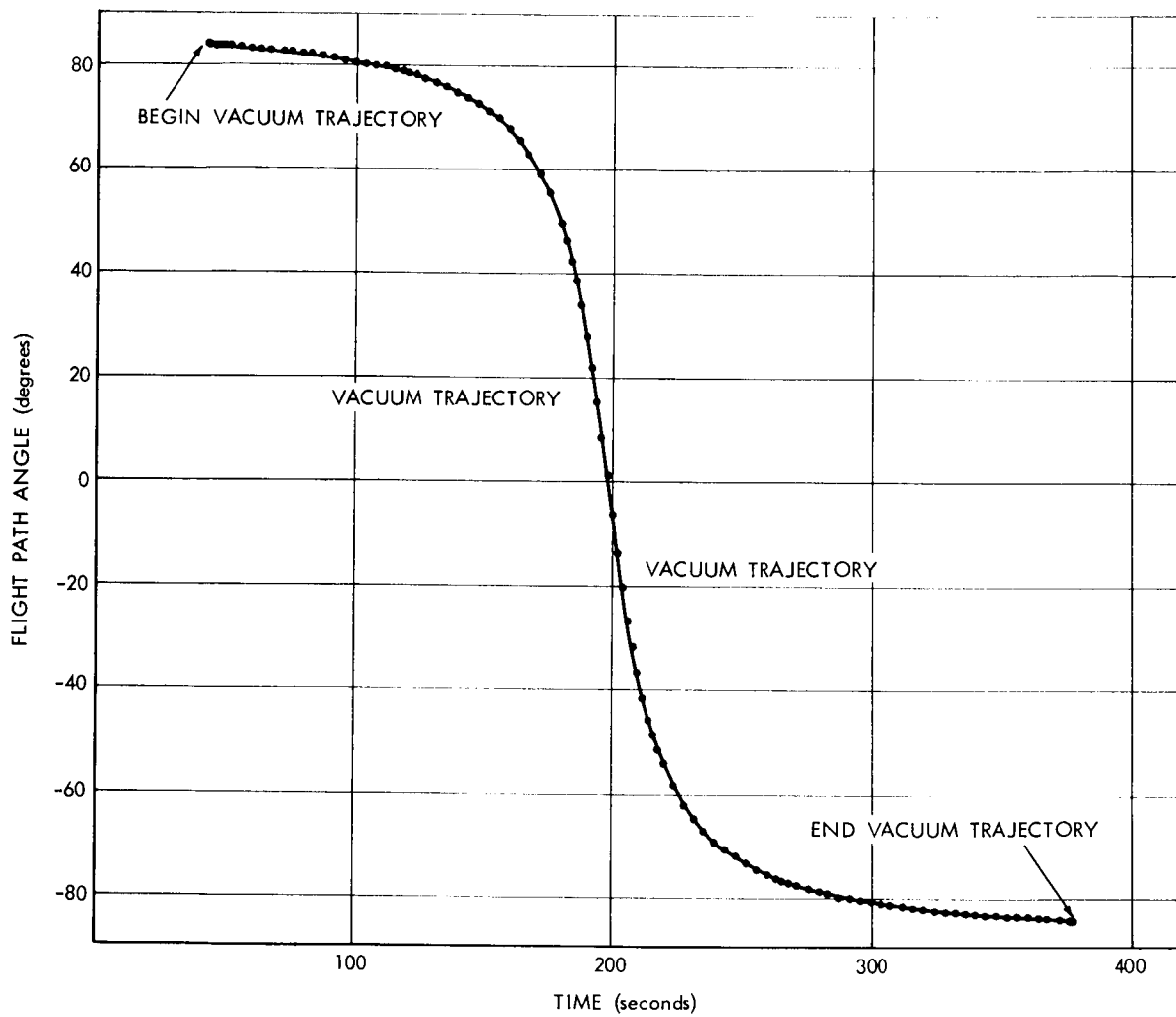


Figure 69. 14.67 UA Radar Plot, Flight Path Angle vs Time



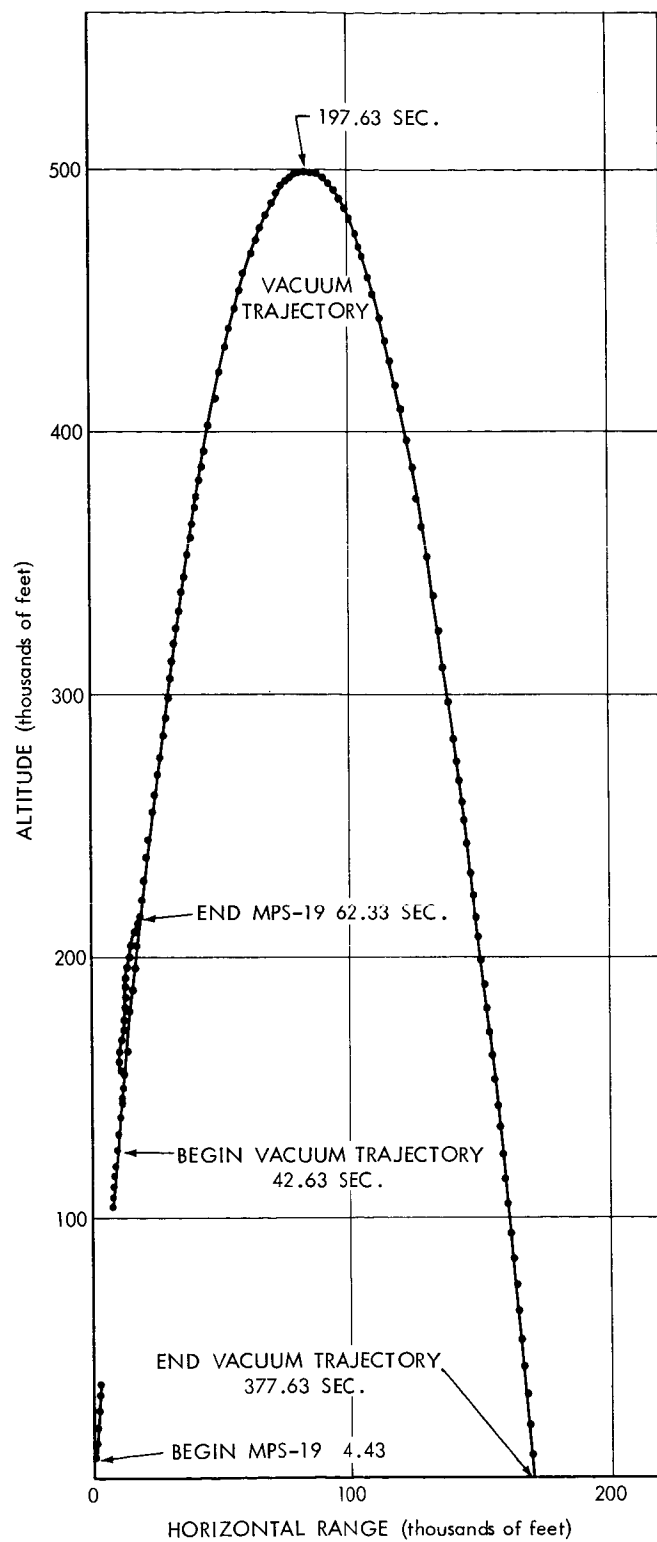


Figure 70. 14.67 UA Radar Plot, Altitude vs Horizontal Range

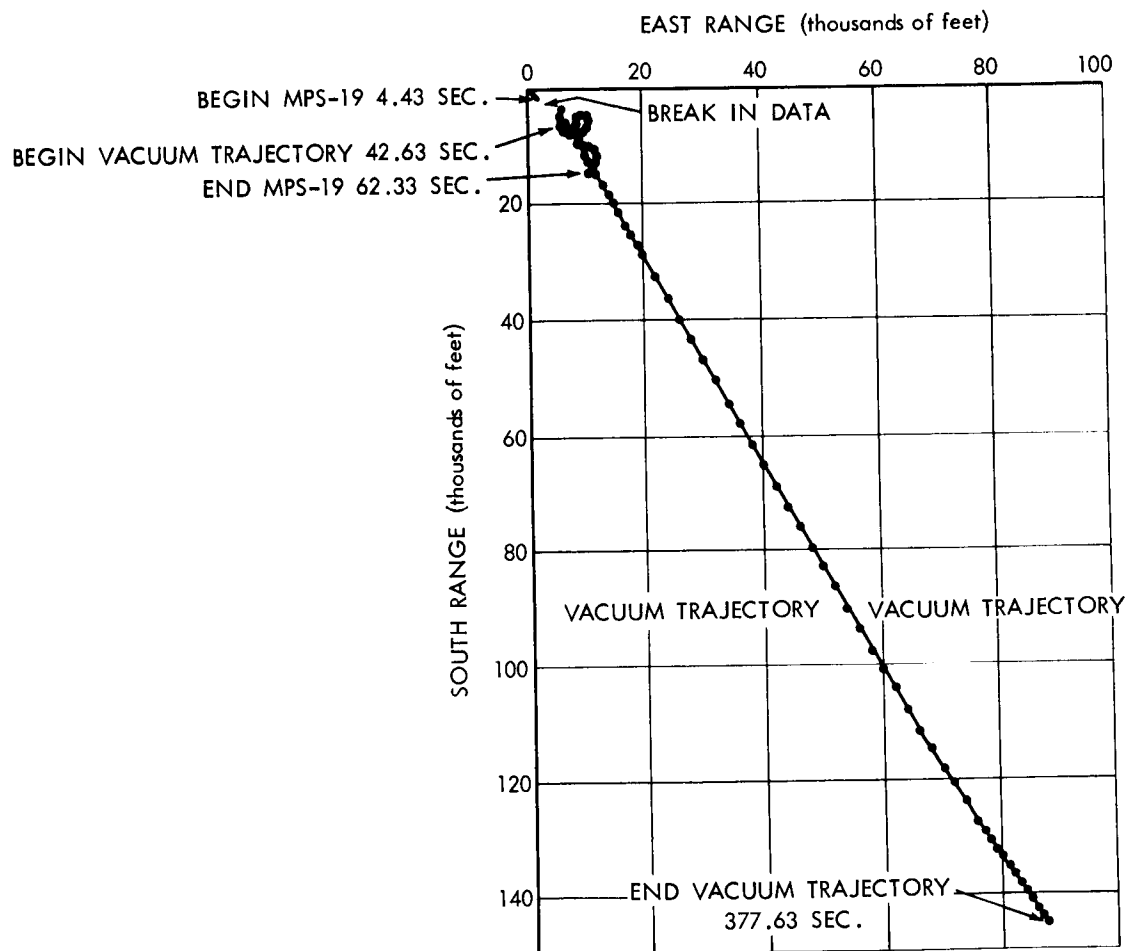


Figure 71. 14.67 UA Radar Plot, South Range vs East Range

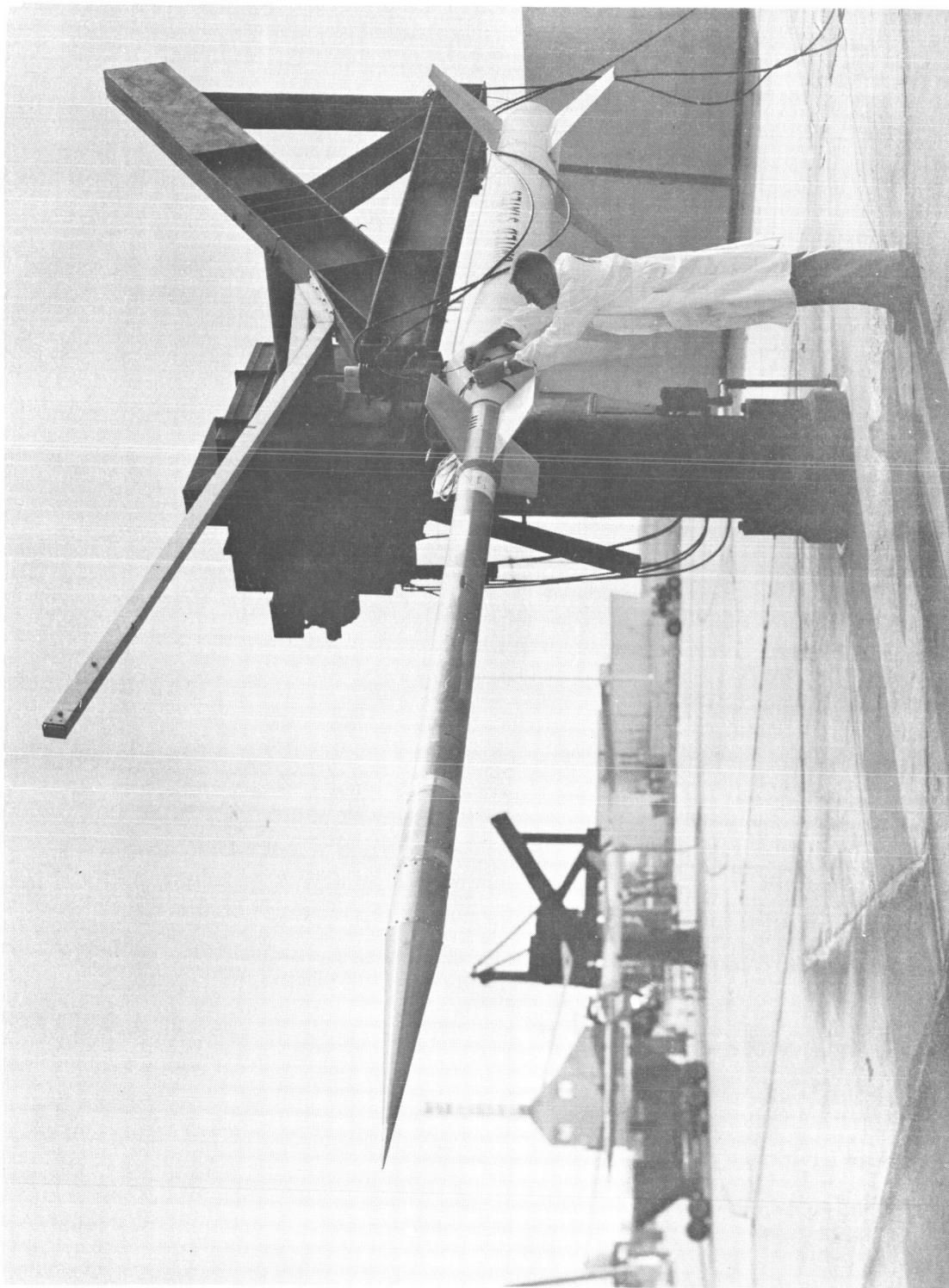


Figure 72. 14.71 CM Photograph

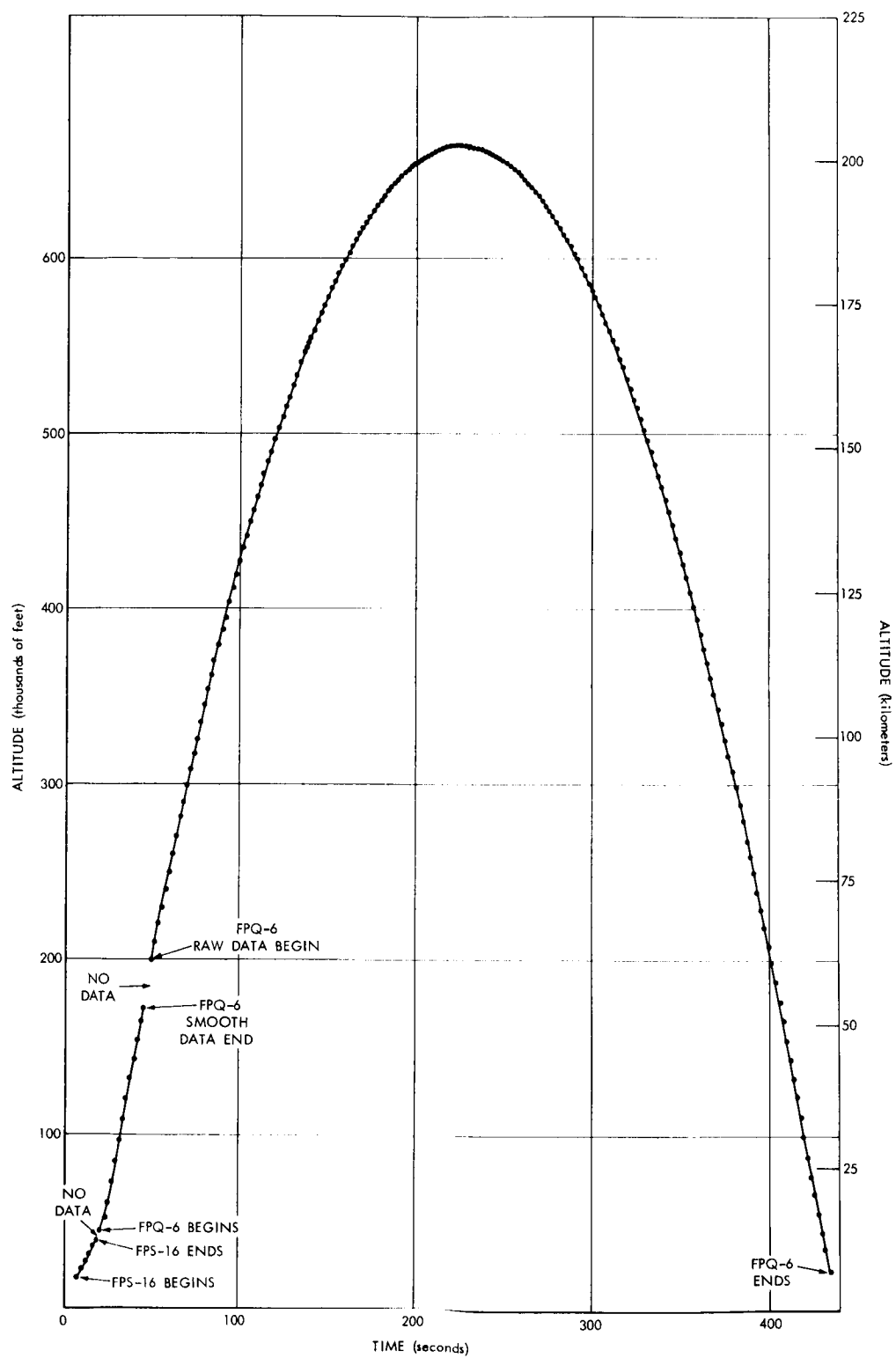


Figure 73. 14.71 CM Radar Plot, Altitude vs Time

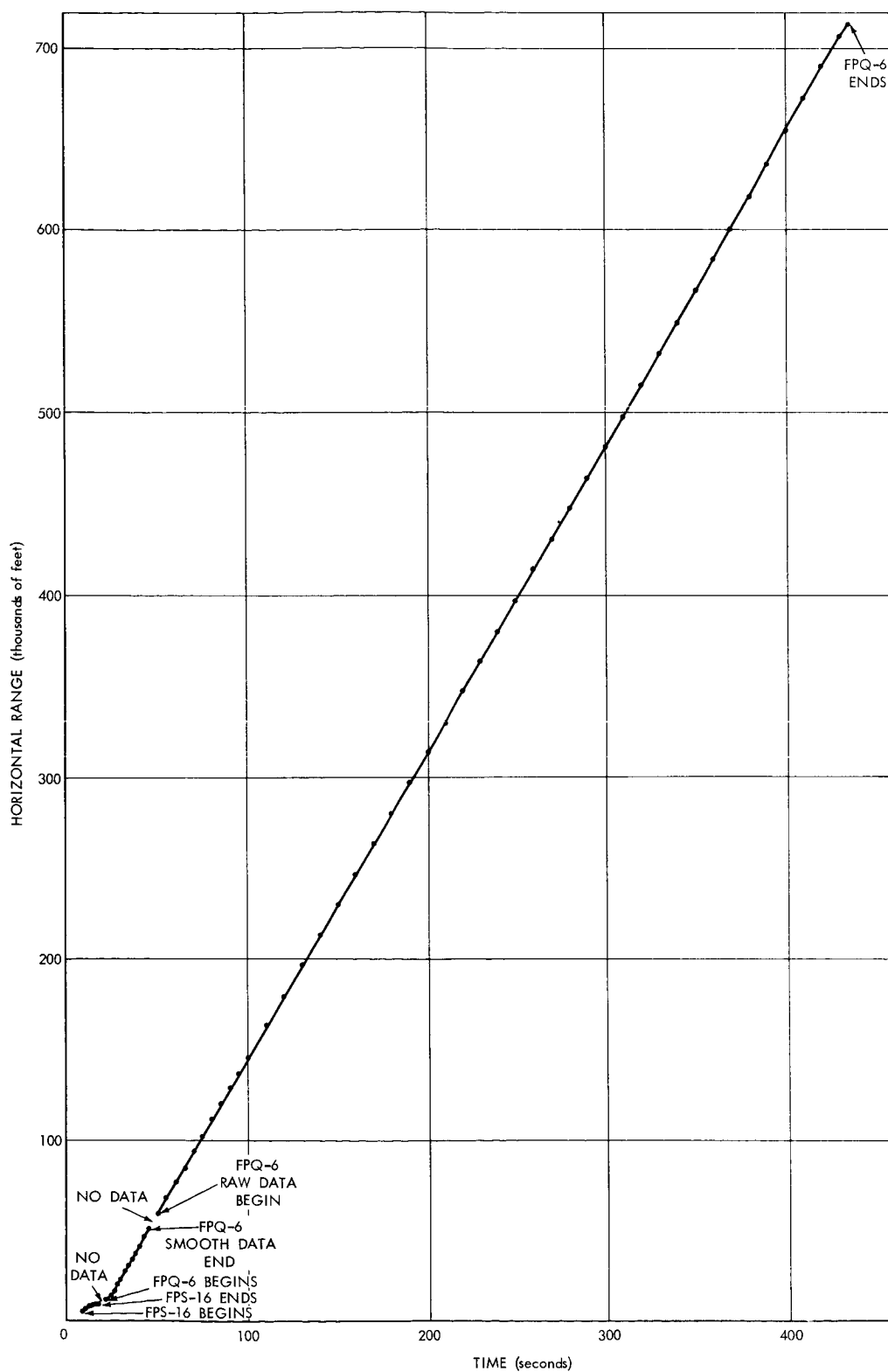


Figure 74. 14.71 CM Radar Plot, Horizontal Range vs Time

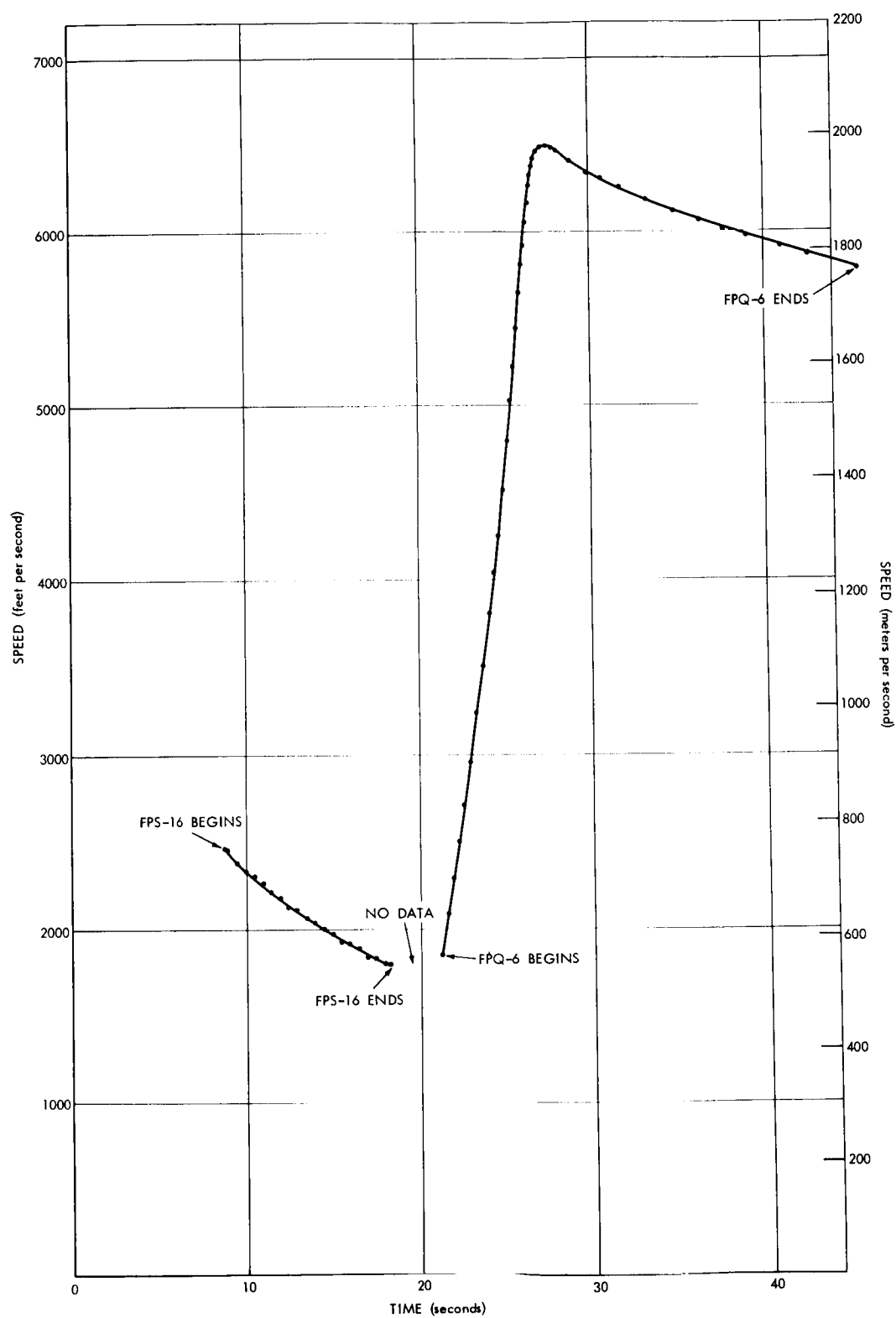


Figure 75. 14.71 CM Radar Plot, Speed vs Time

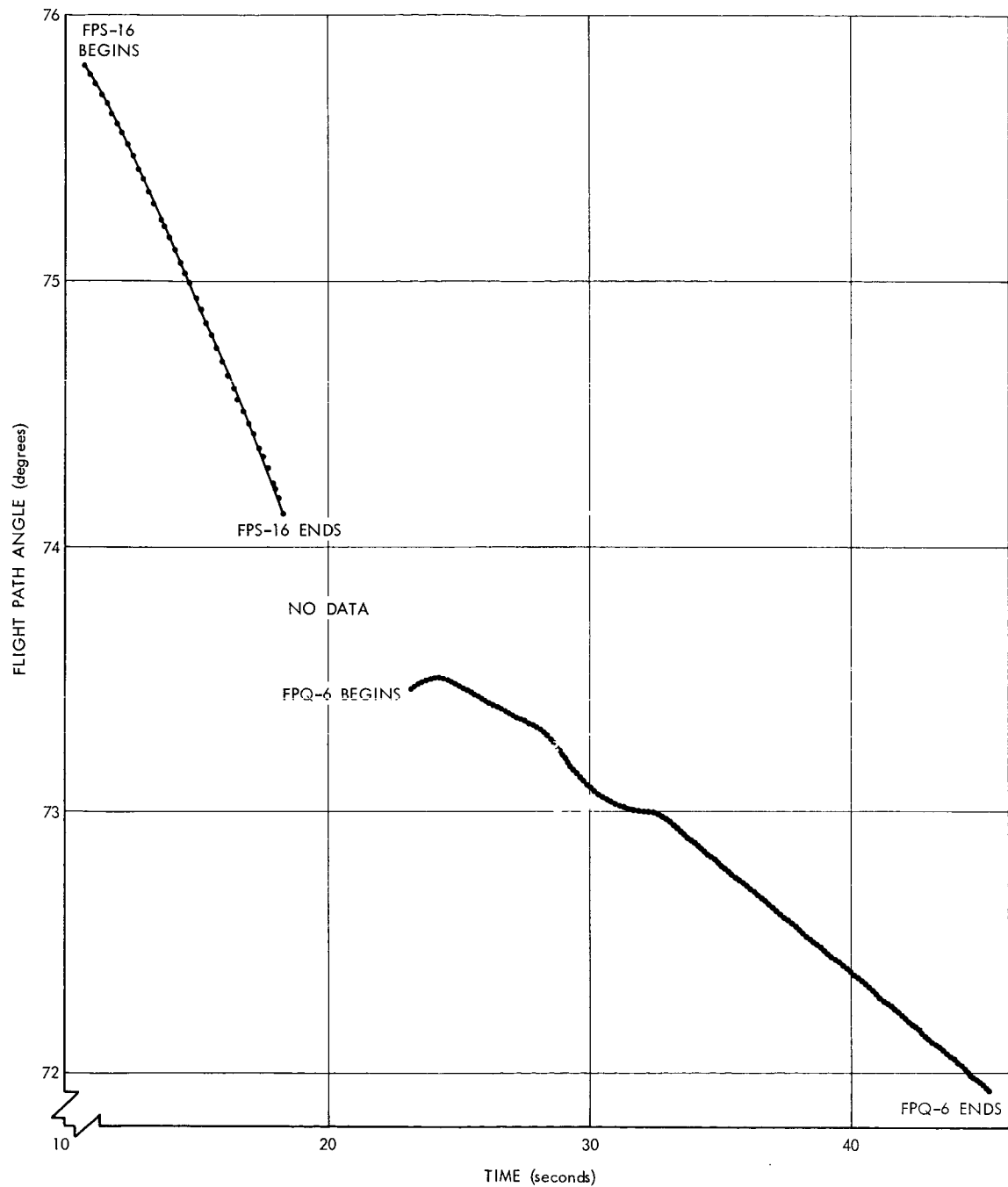


Figure 76. 14.71 CM Radar Plot, Flight Path Angle vs Time

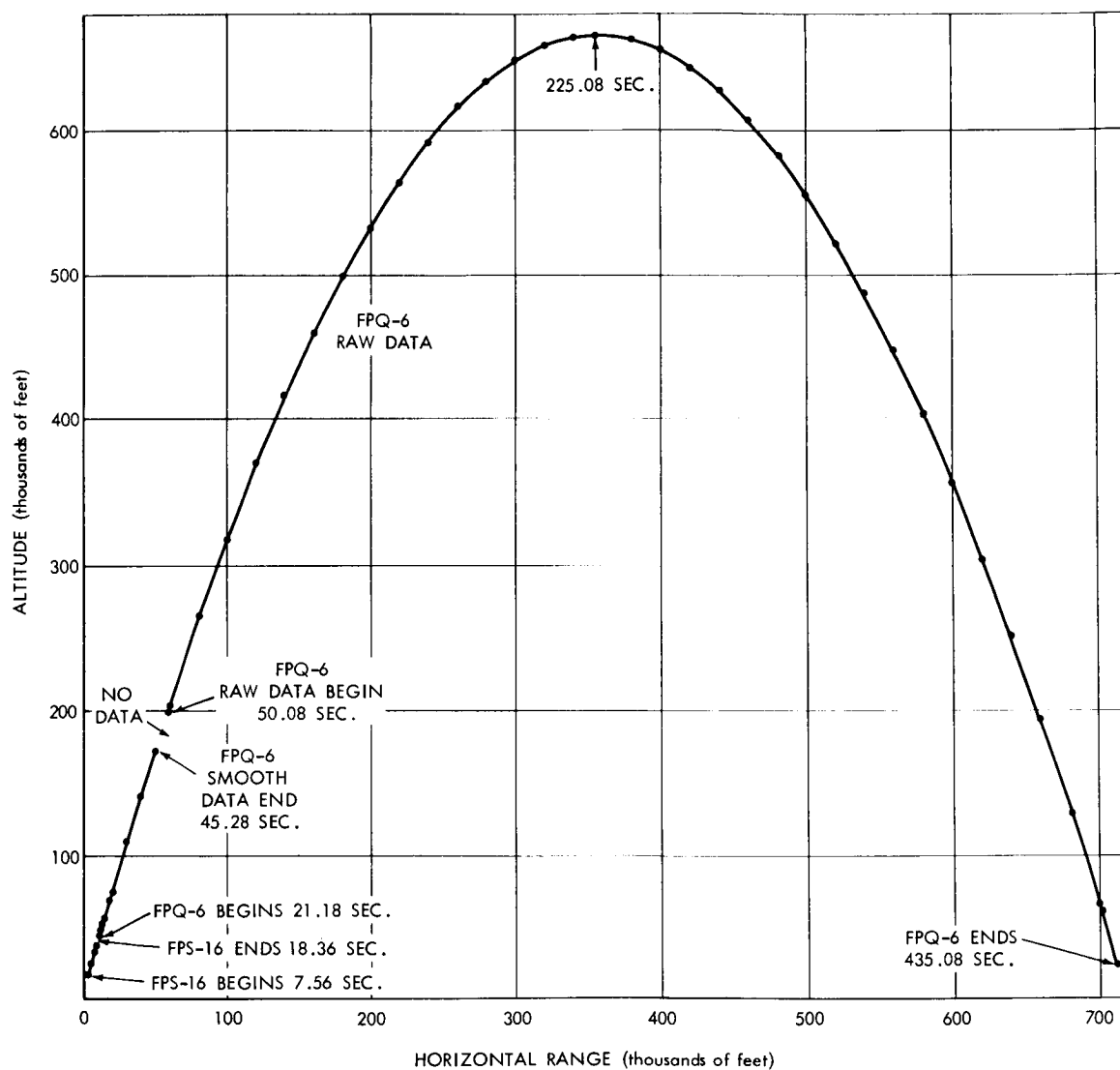


Figure 77. 14.71 CM Radar Plot, Altitude vs Horizontal Range



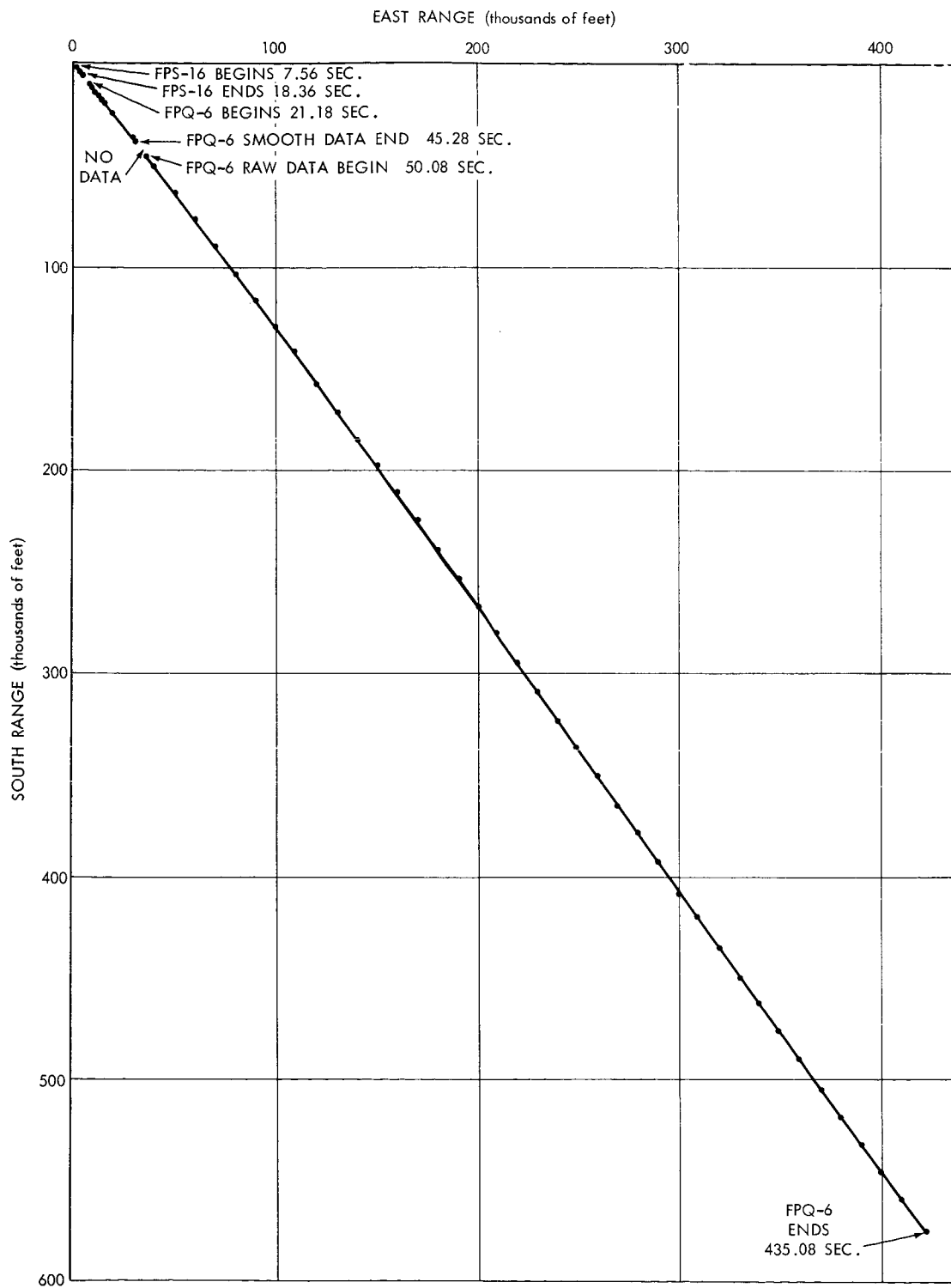


Figure 78. 14.71 CM Radar Plot, South Range vs East Range



Figure 79. 14.72 CM Photograph

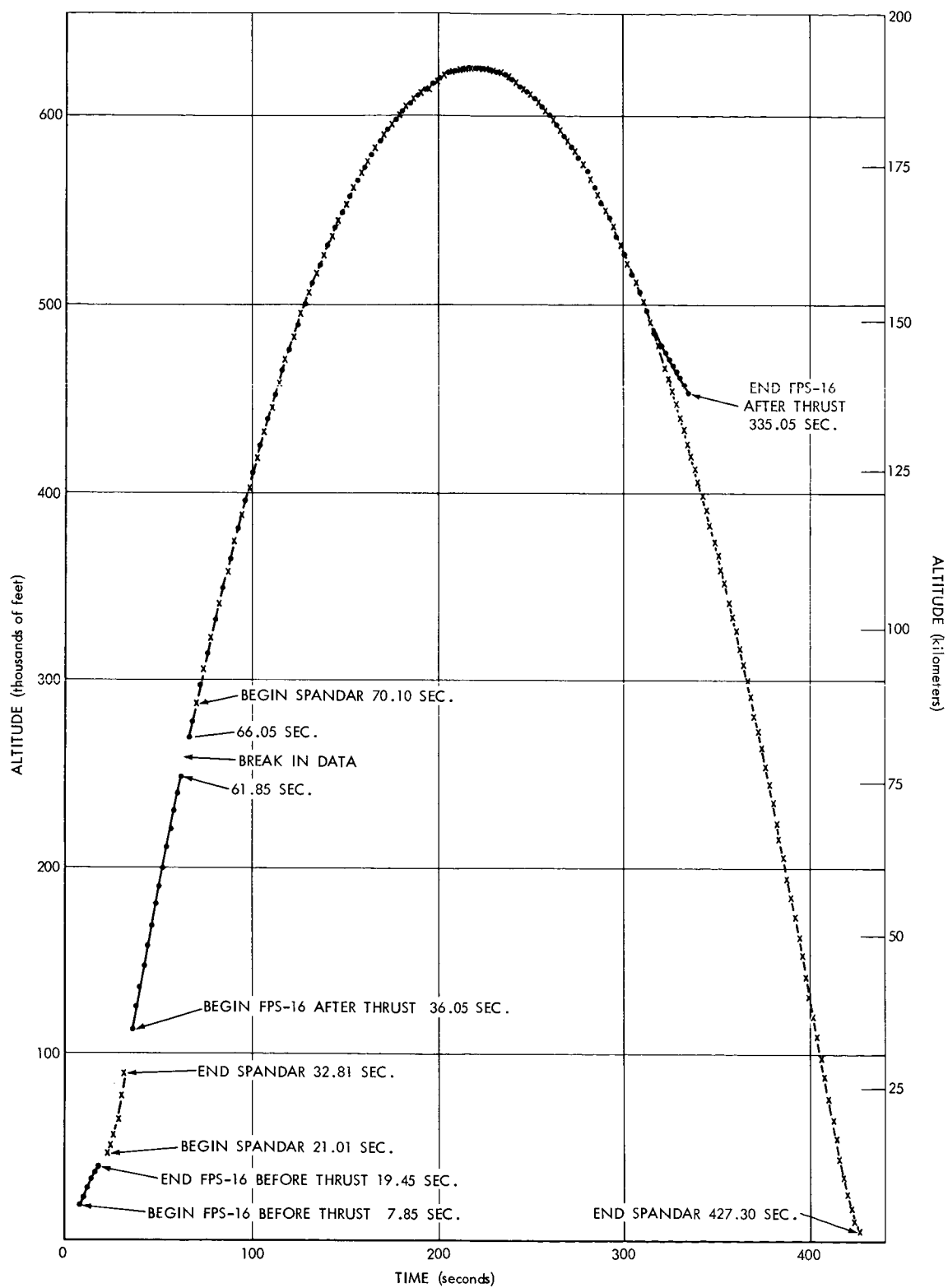


Figure 80. 14.72 CM Radar Plot, Altitude vs Time

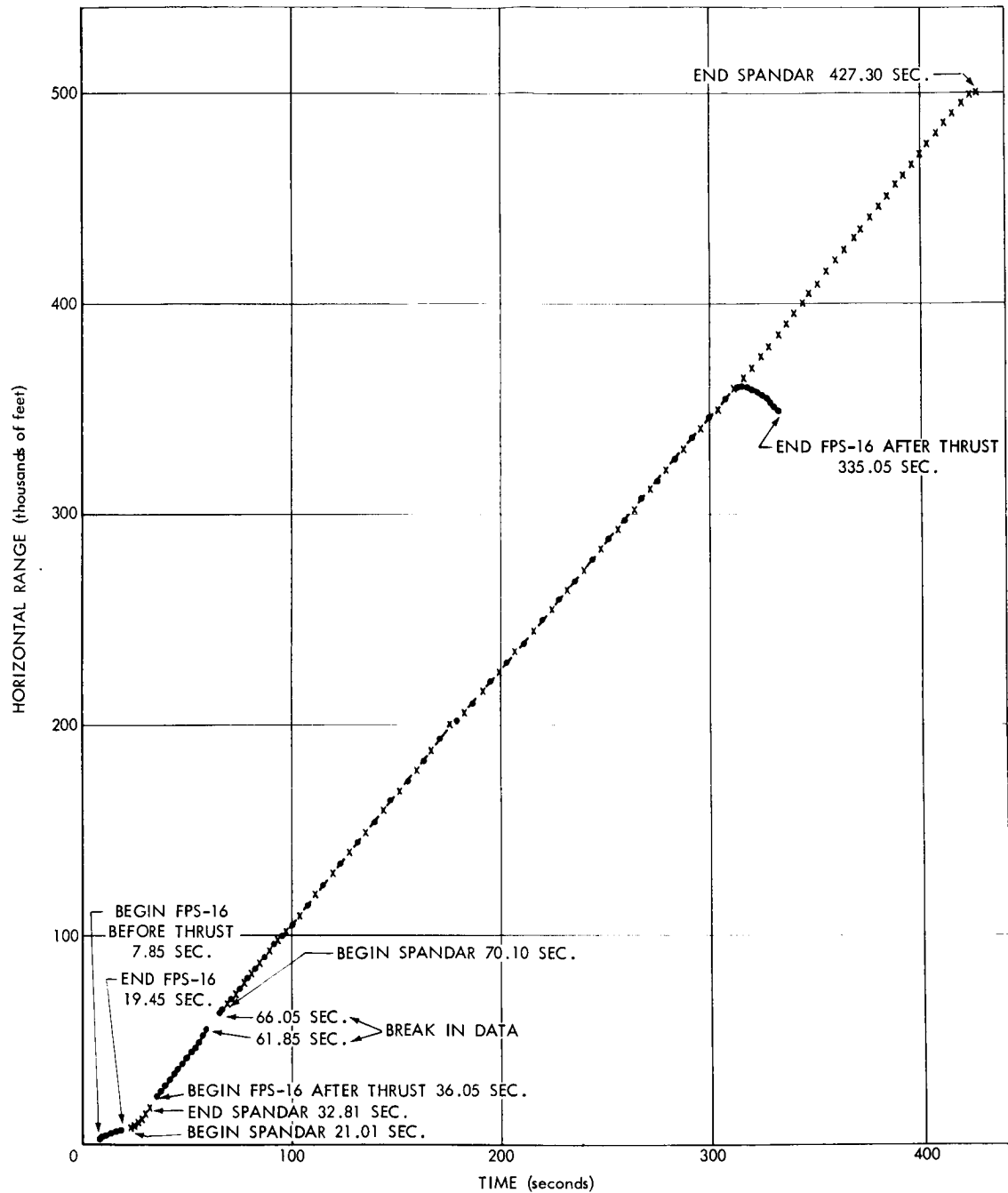


Figure 81. 14.72 CM Radar Plot, Horizontal Range vs Time

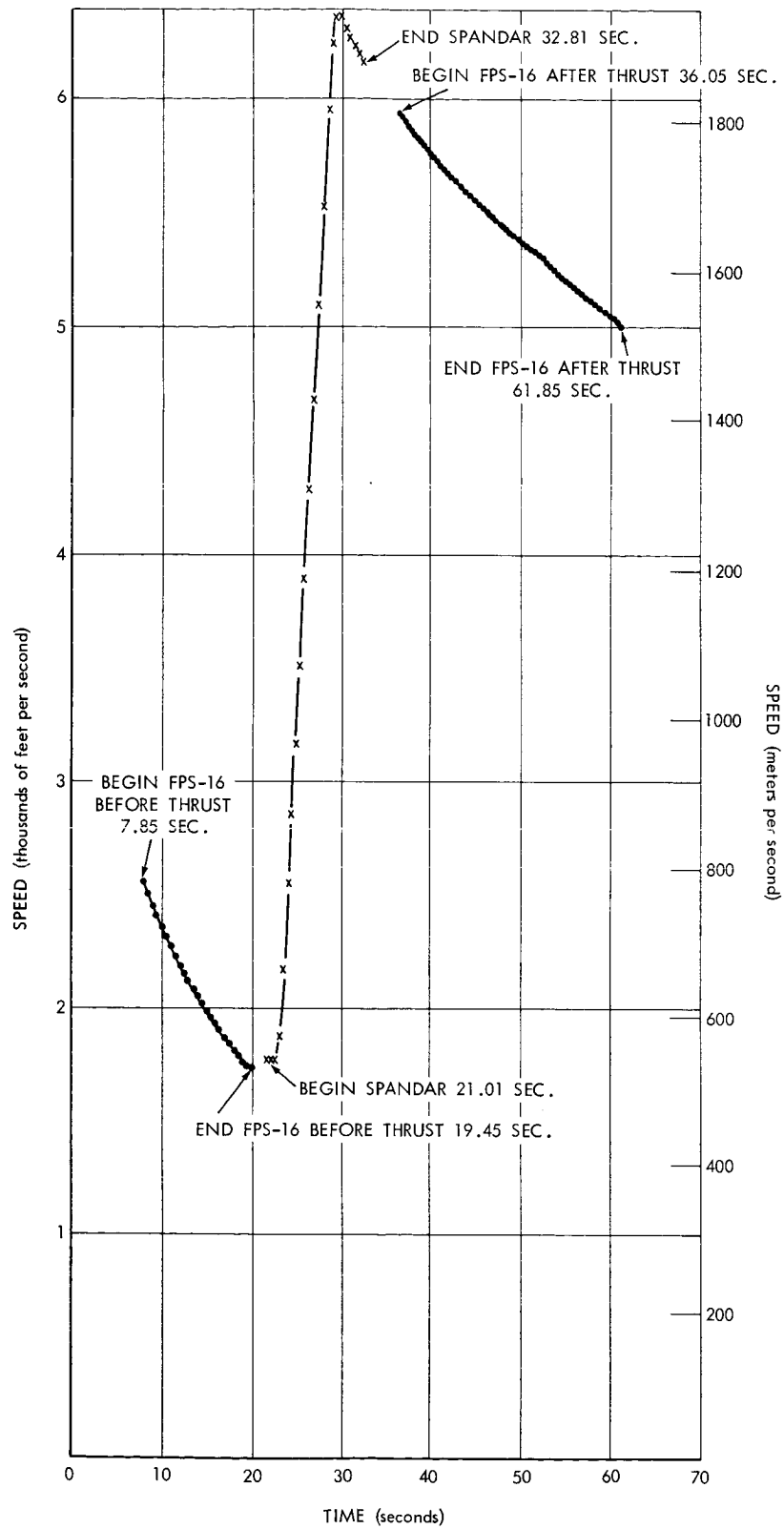


Figure 82. 14.72 CM Radar Plot, Speed vs Time

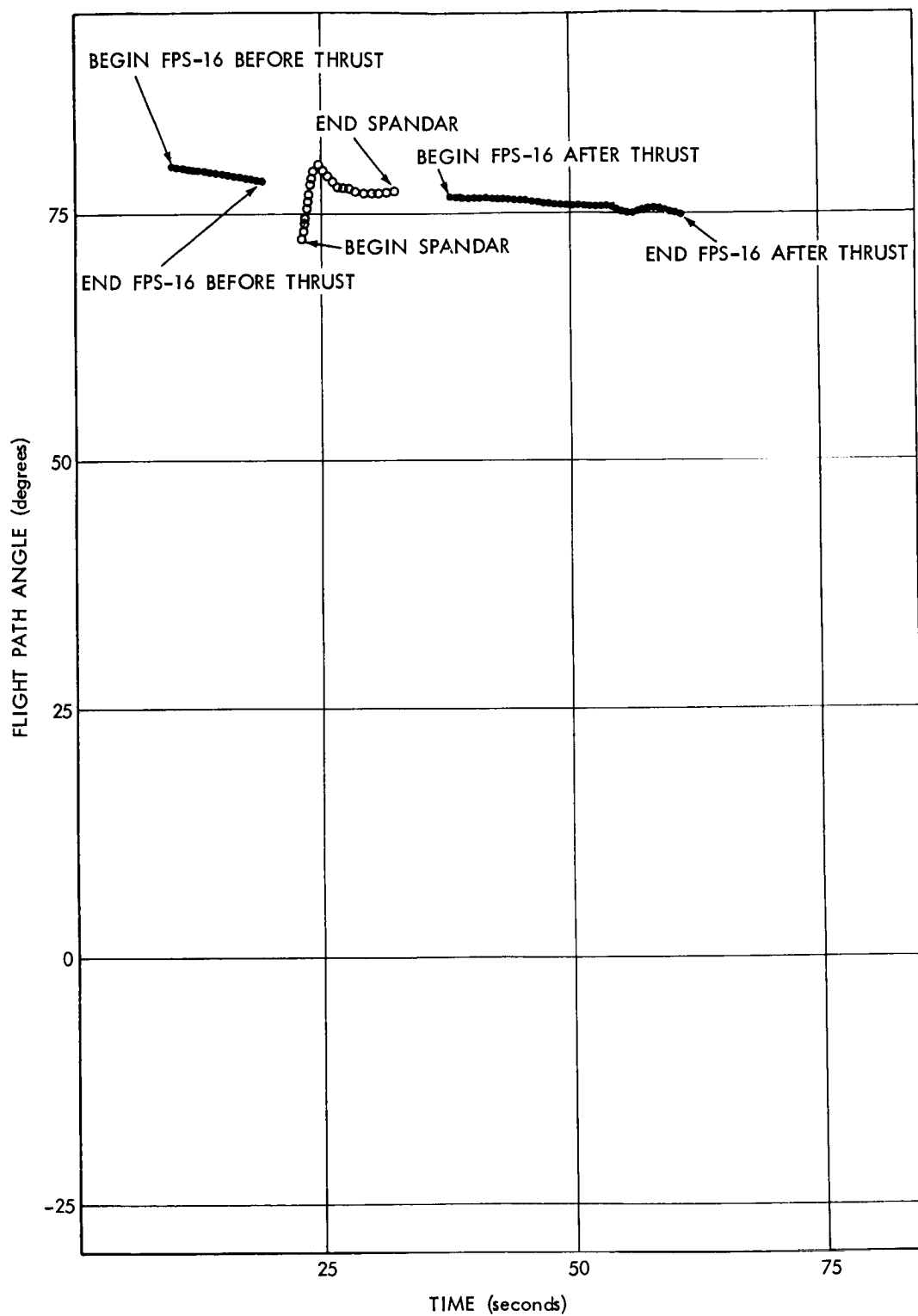


Figure 83. 14.72 CM Radar Plot, Flight Path Angle vs Time

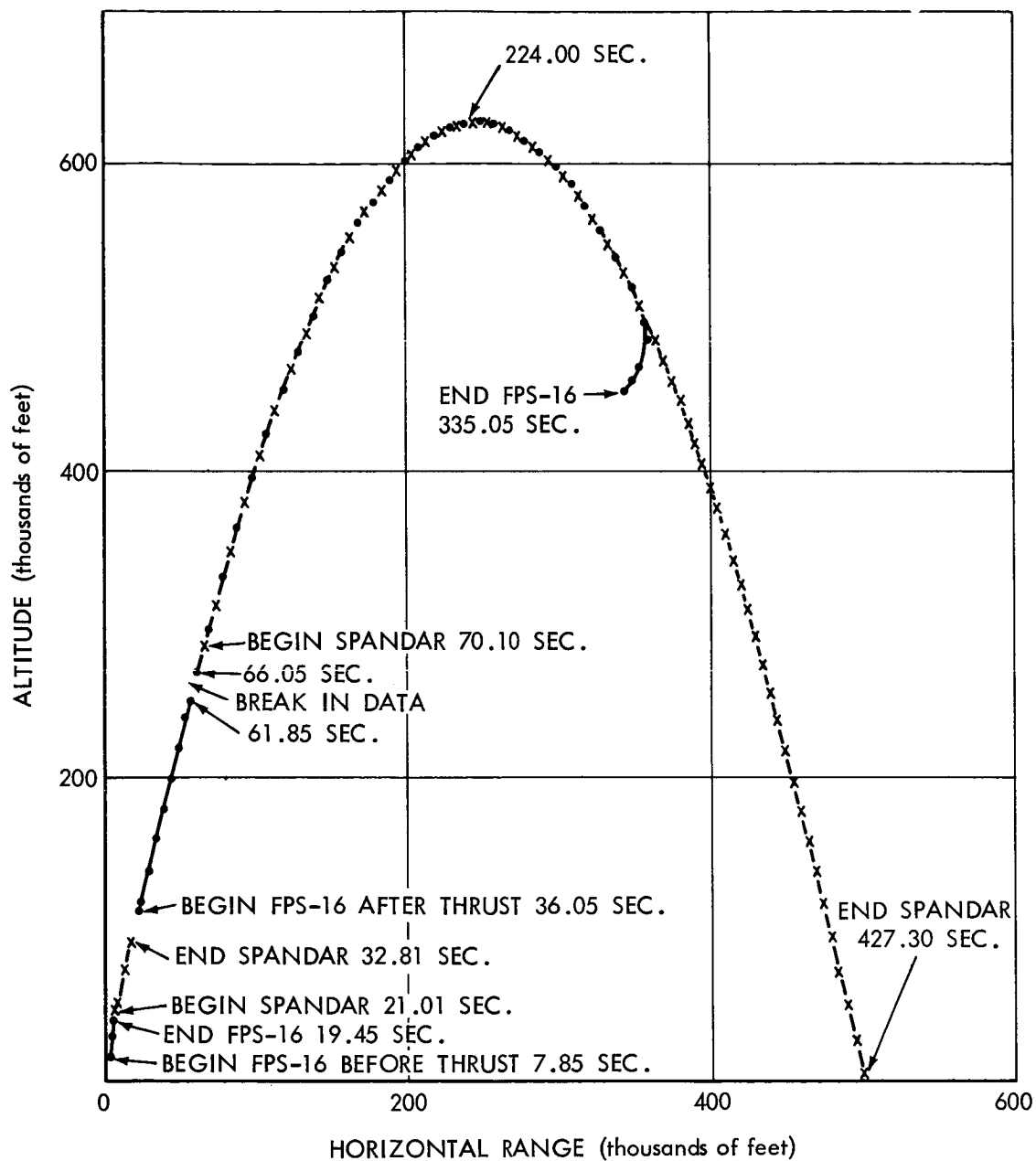


Figure 84. 14.72 CM Radar Plot, Altitude vs Horizontal Range

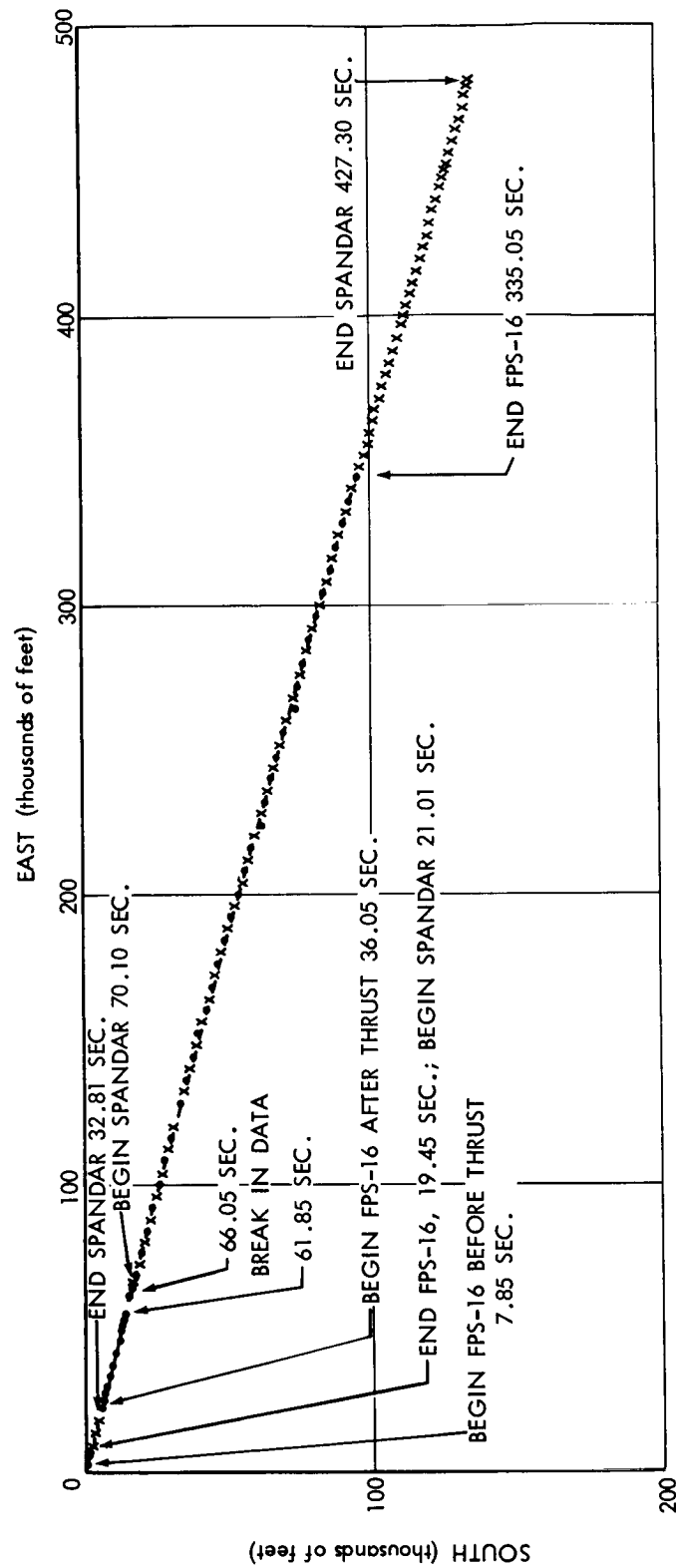


Figure 85. 14.72 CM Radar Plot, South Range vs East Range



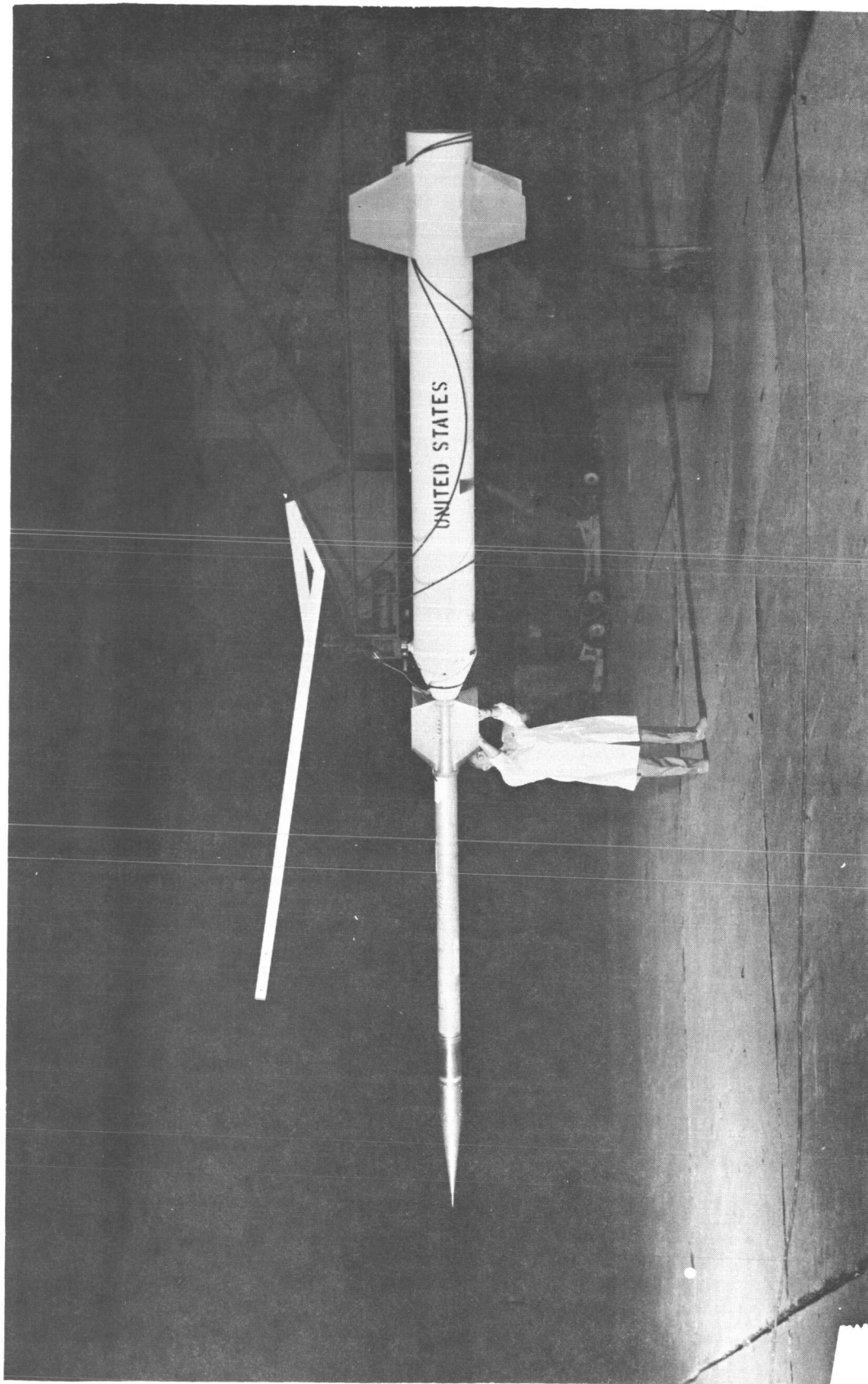


Figure 86. 14.73 CM Photograph

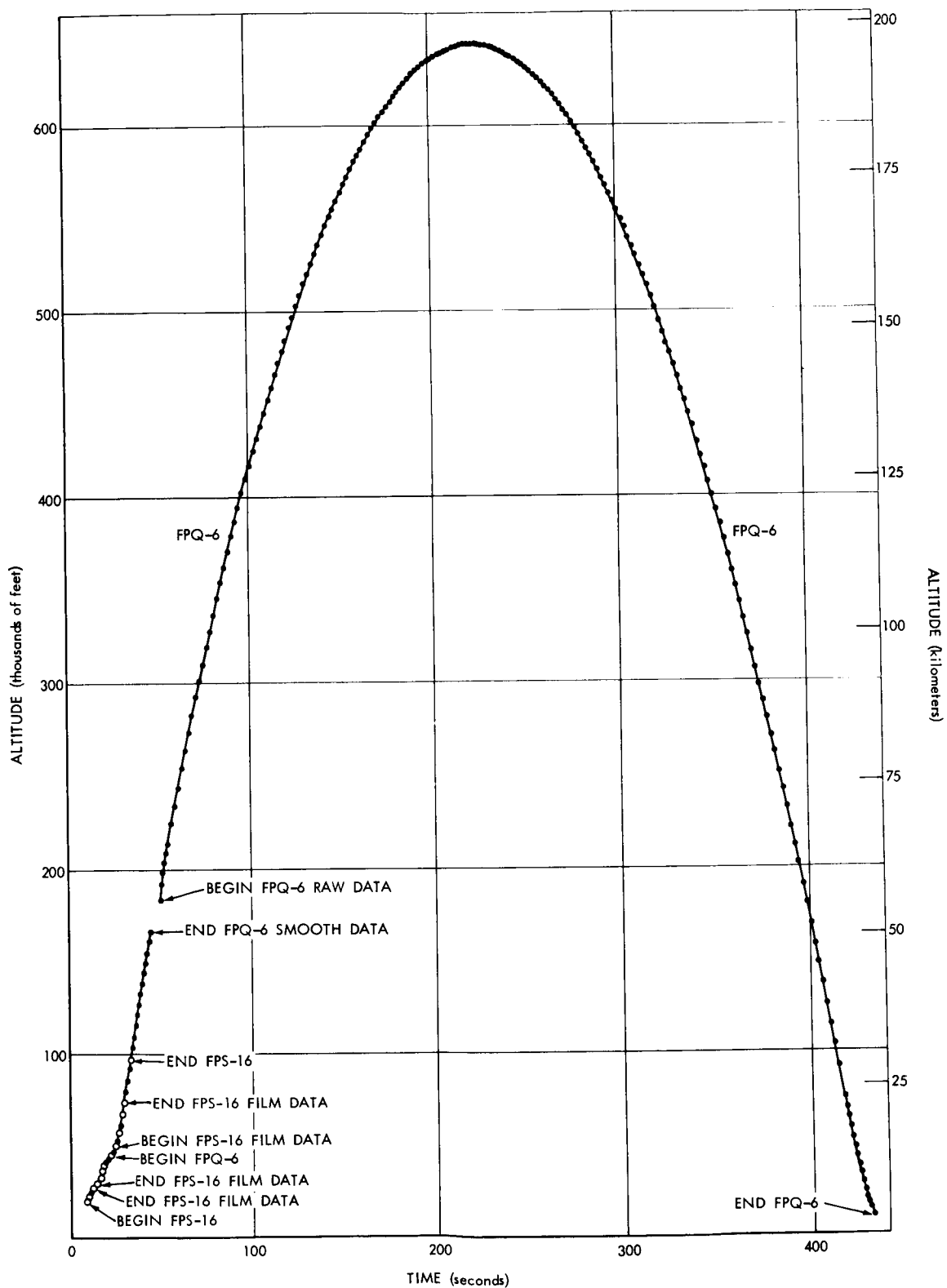


Figure 87. 14.73 CM Radar Plot, Altitude vs Time

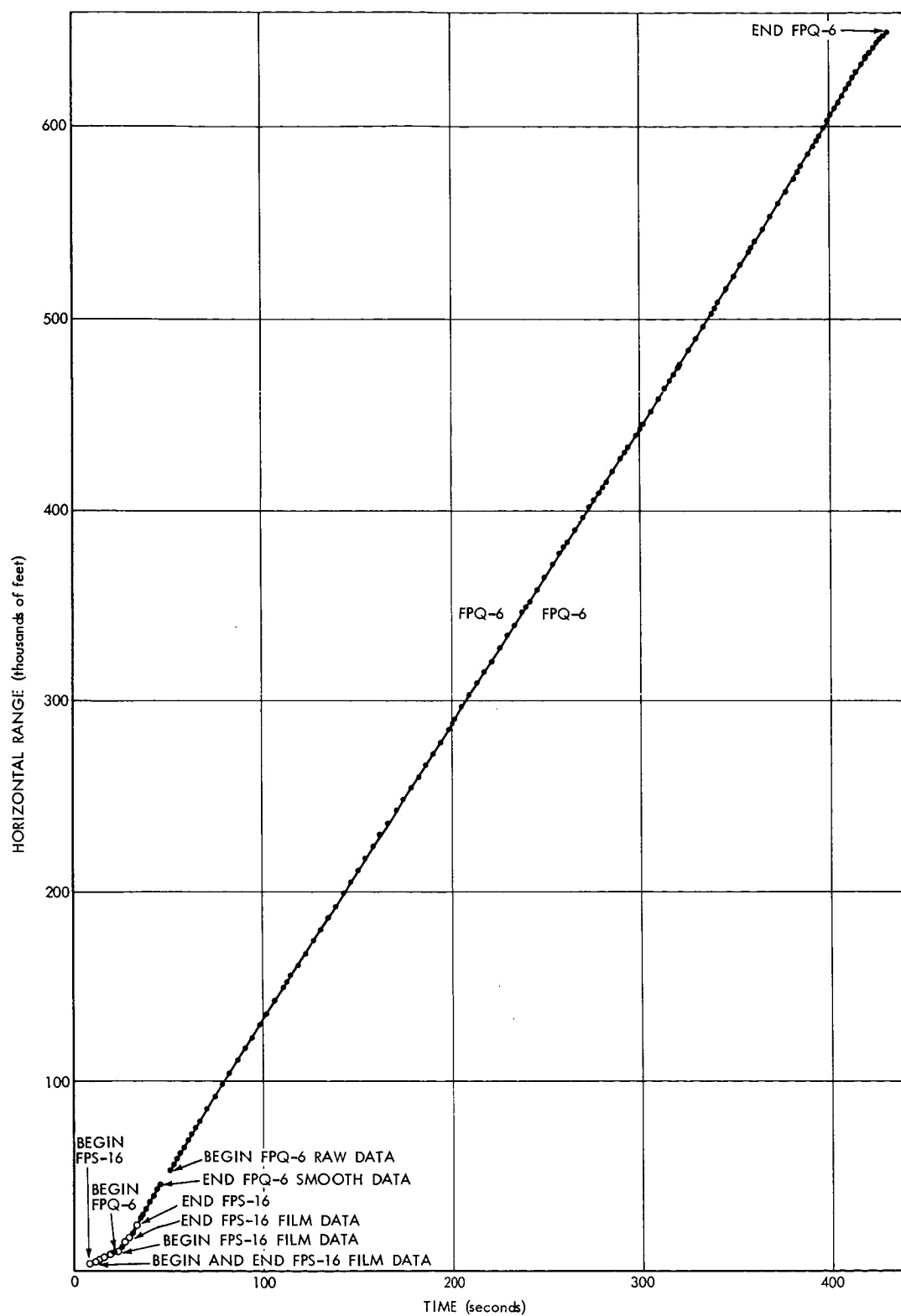


Figure 88. 14.73 CM Radar Plot, Horizontal Range vs Time

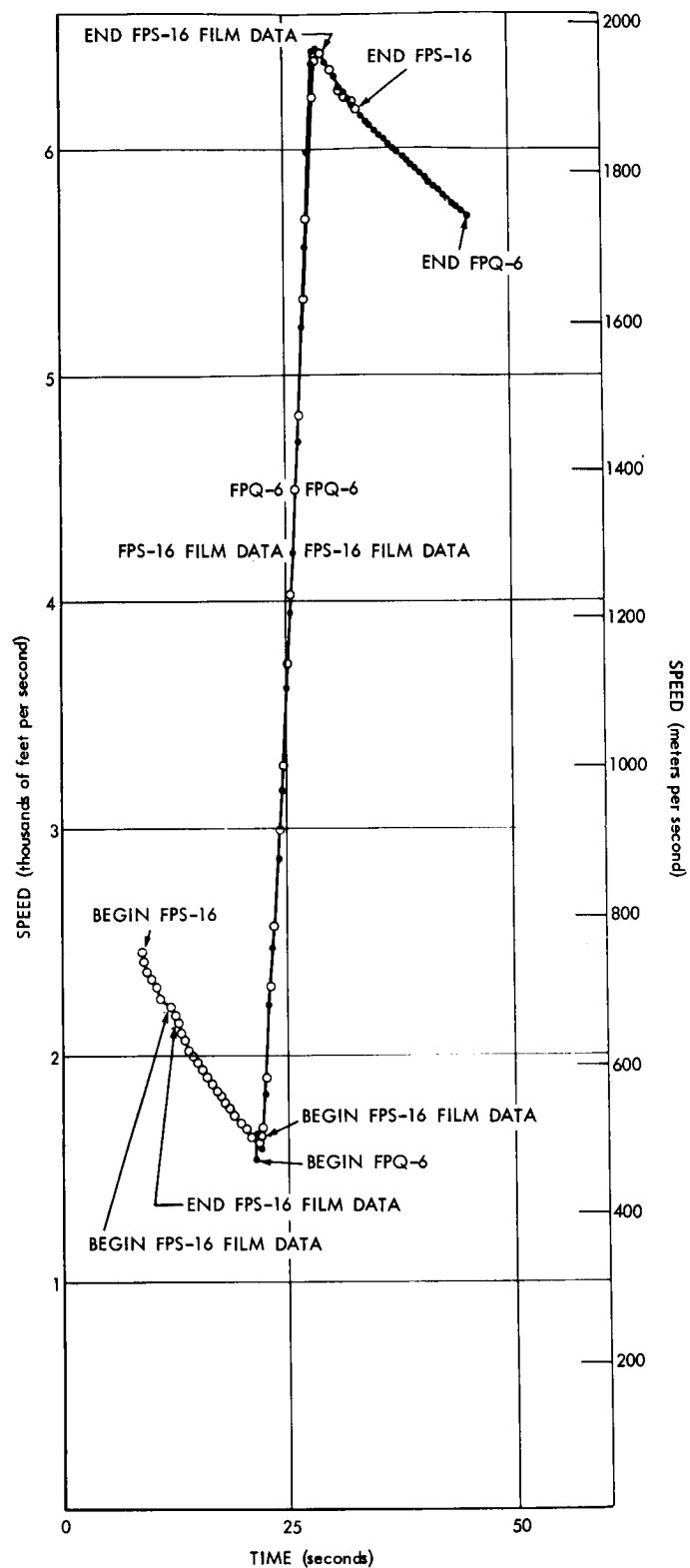


Figure 89. 14.73 CM Radar Plot, Speed vs Time

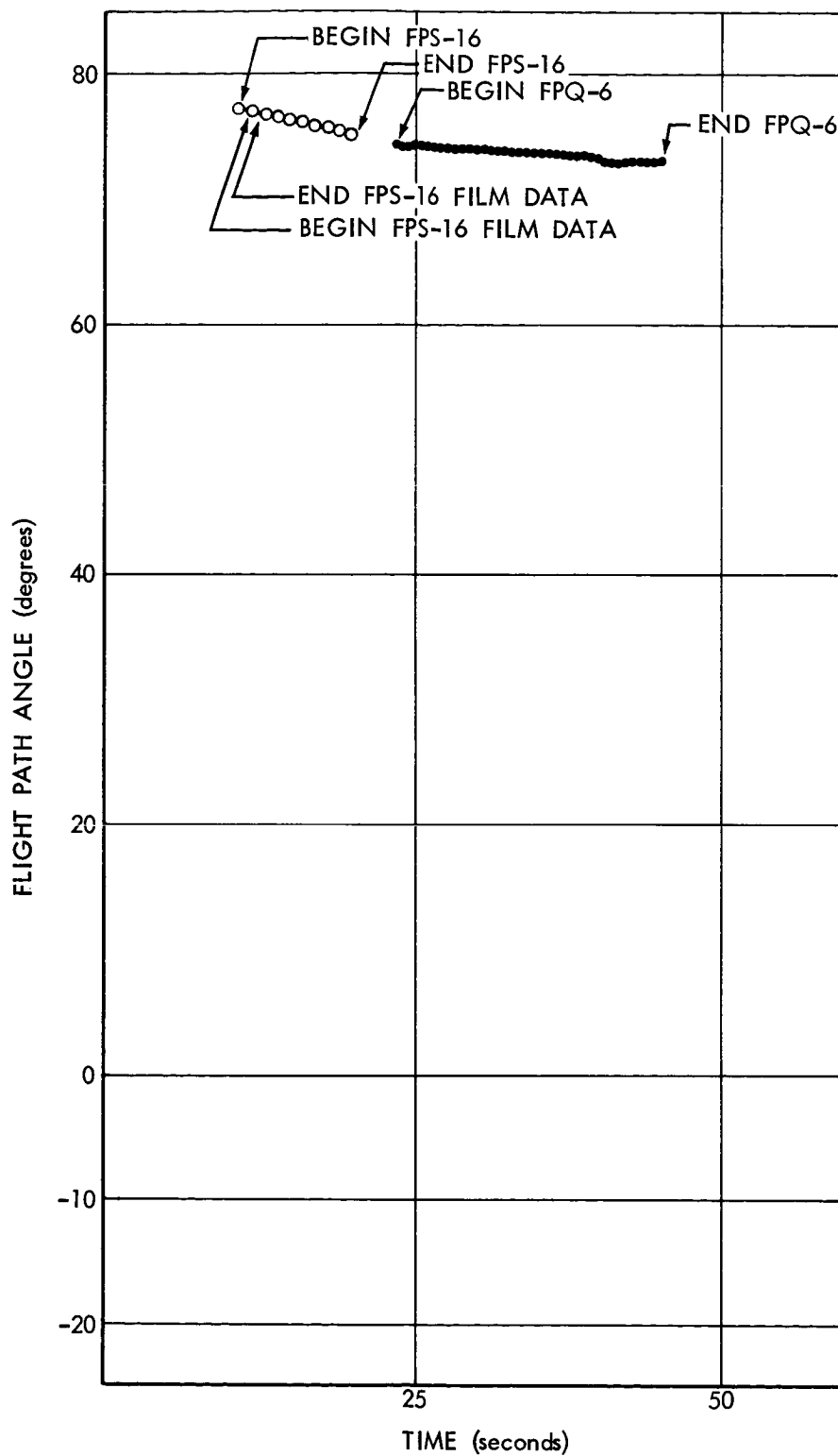


Figure 90. 14.73 CM Radar Plot, Flight Path Angle vs Time

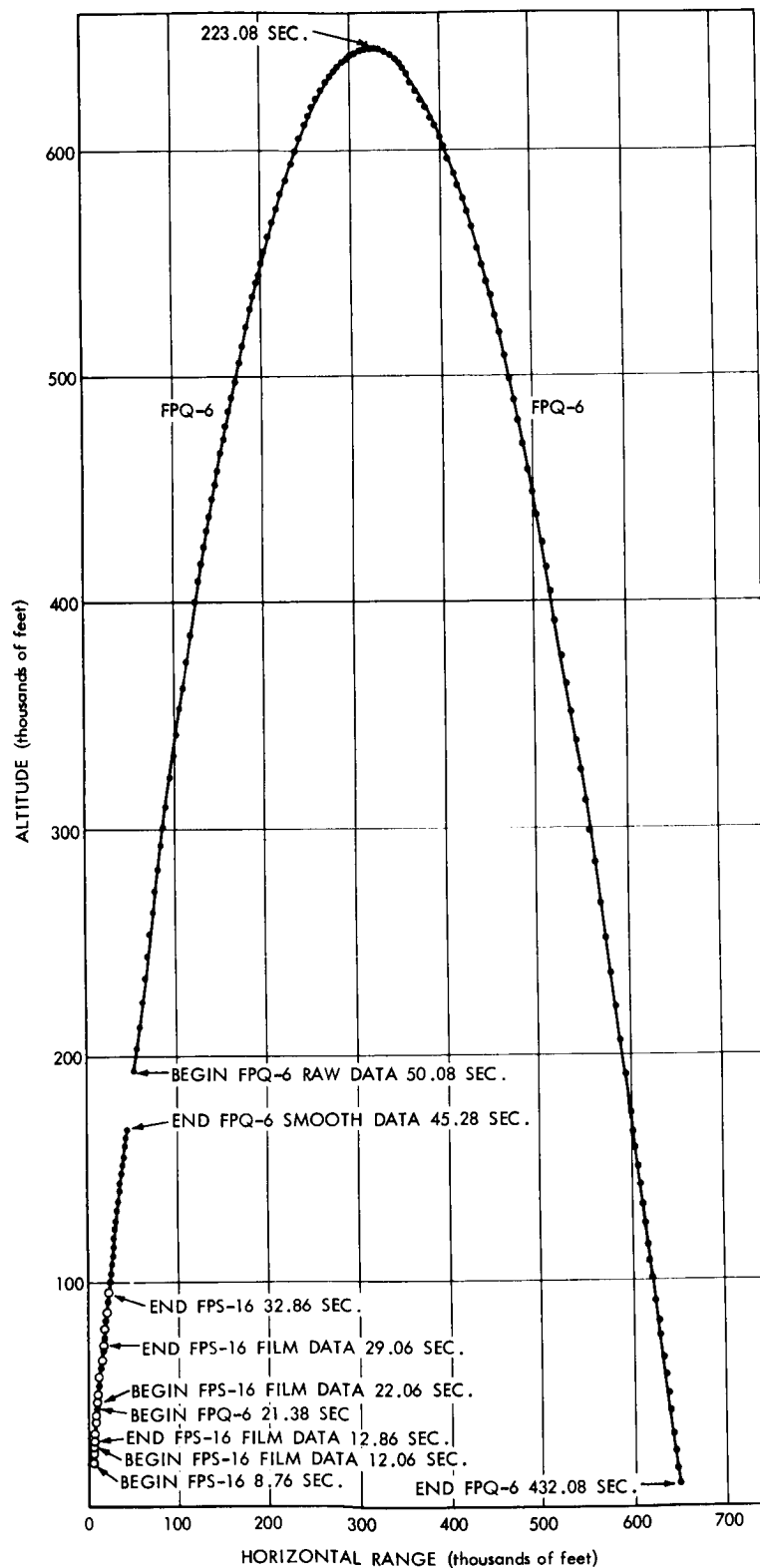


Figure 91. 14.73 CM Radar Plot, Altitude vs Horizontal Range

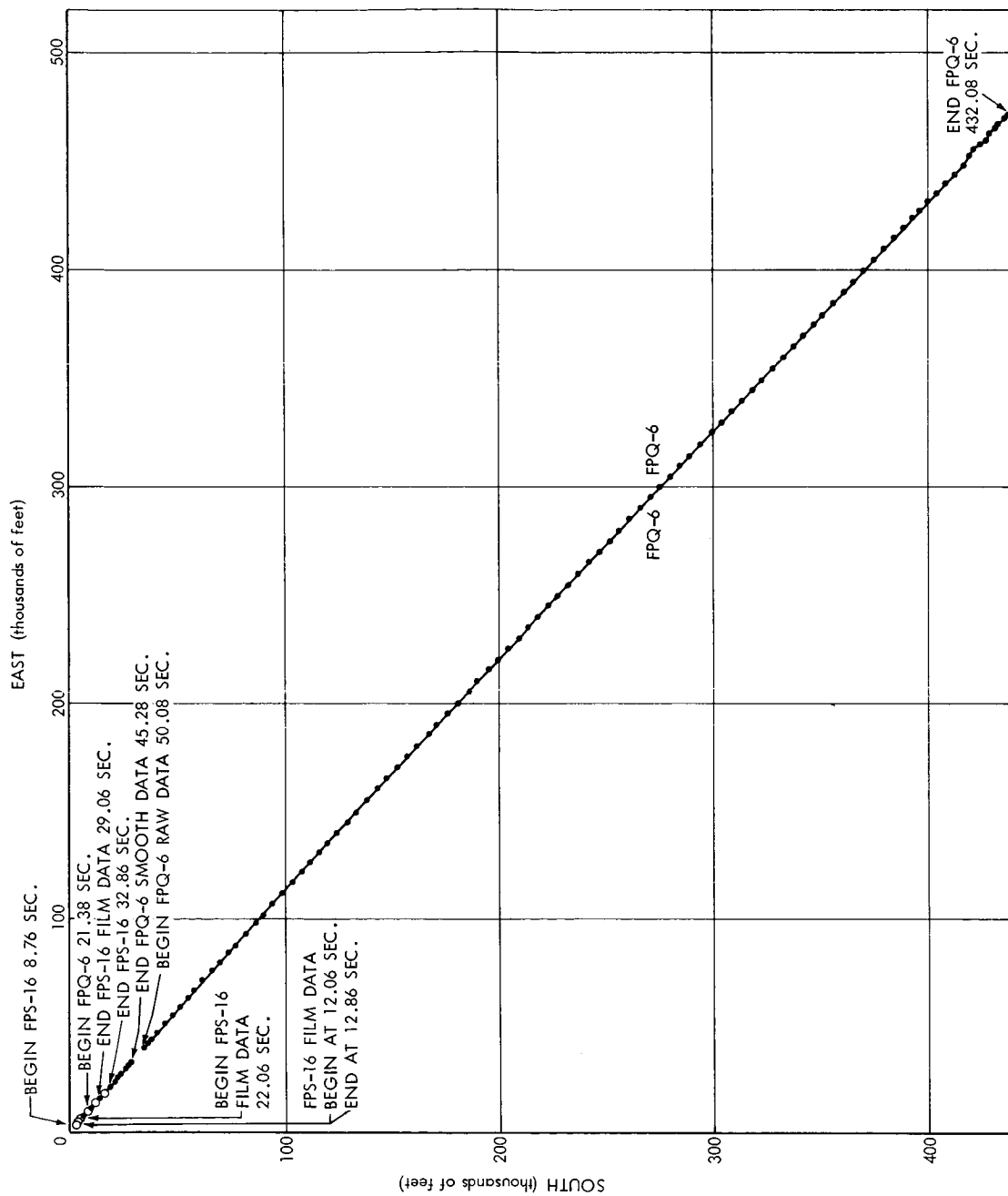


Figure 92. 14.73 CM Radar Plot, South Range vs East Range

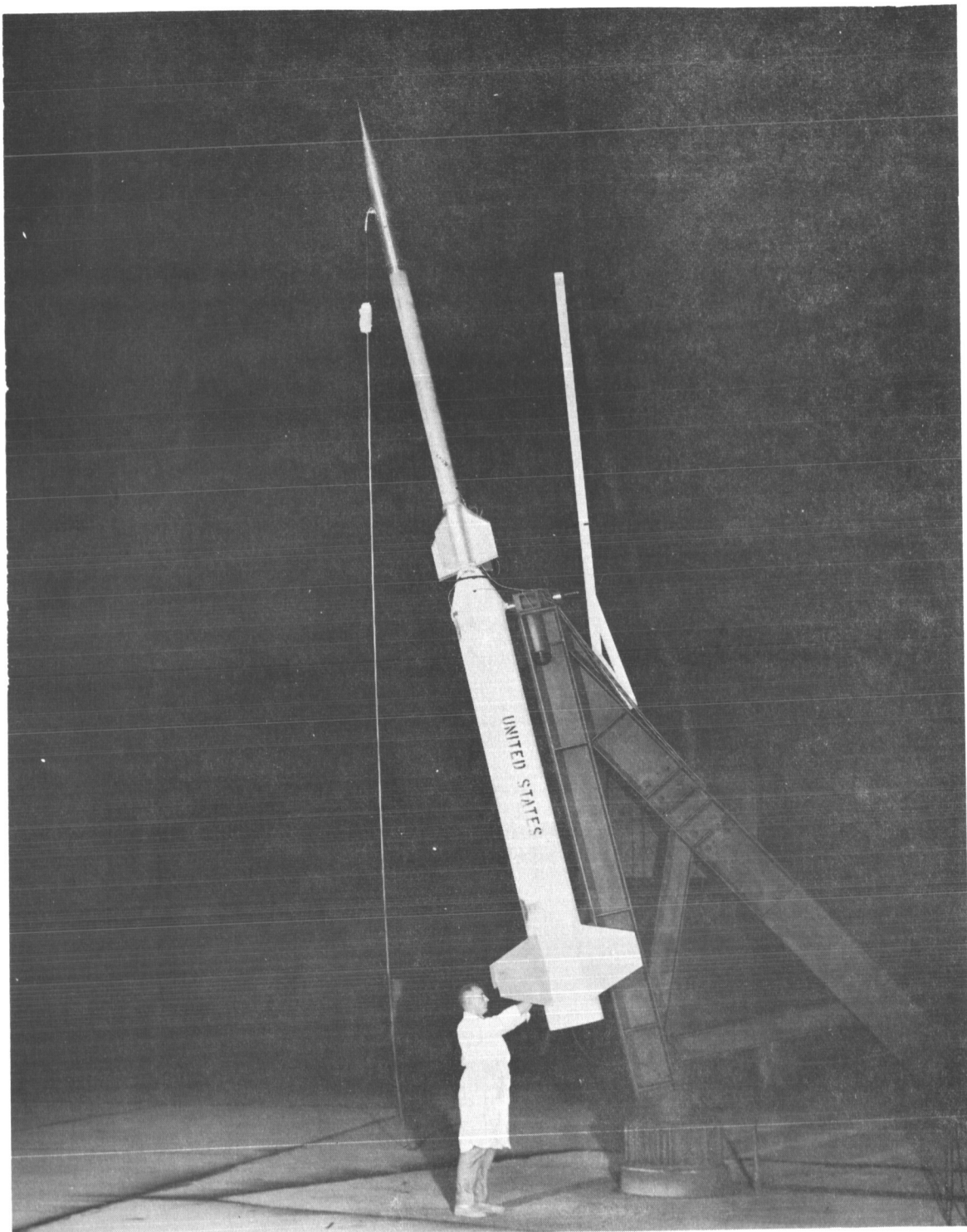


Figure 93. 14.74 CM Photograph



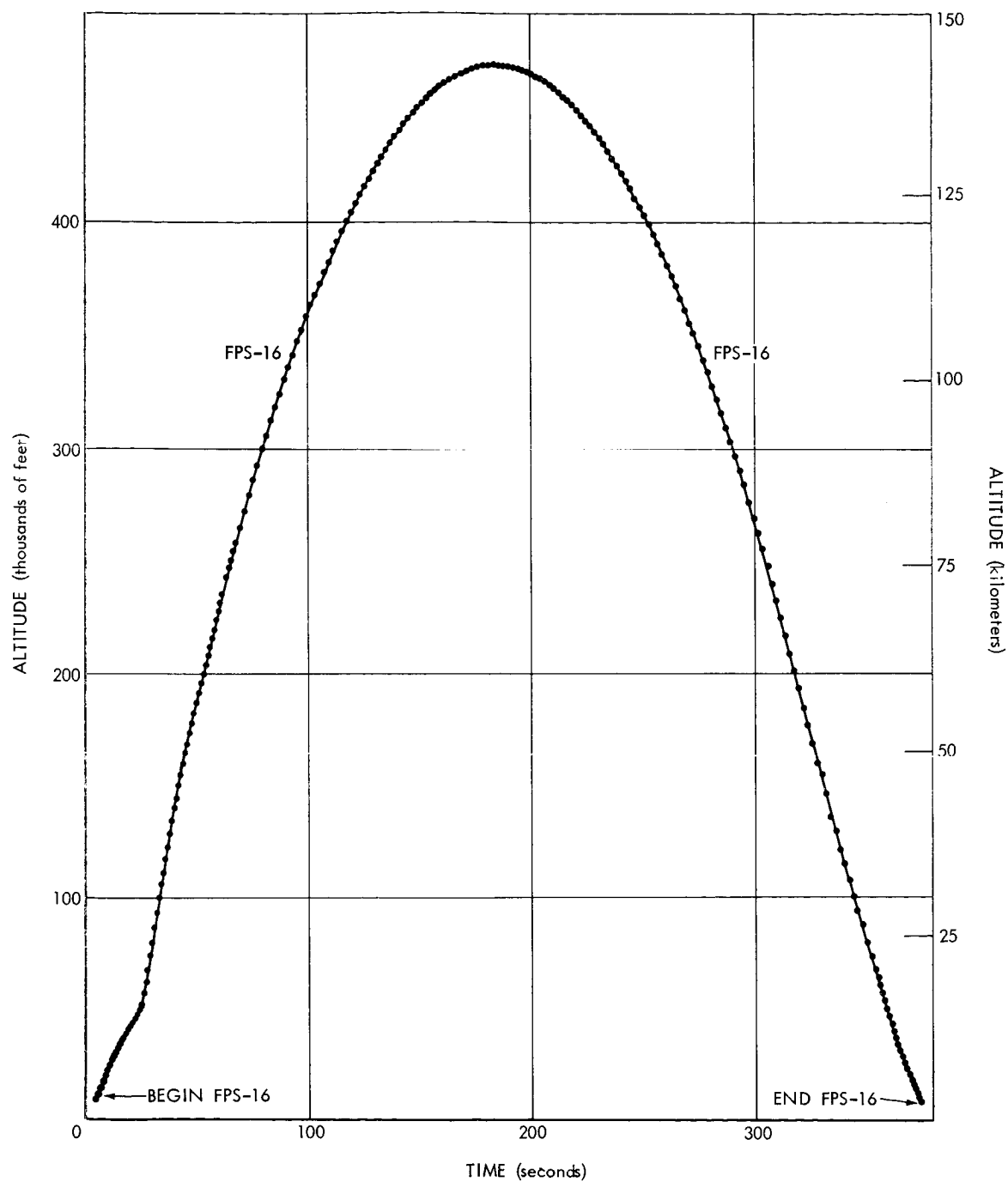


Figure 94. 14.74 CM Radar Plot, Altitude vs Time

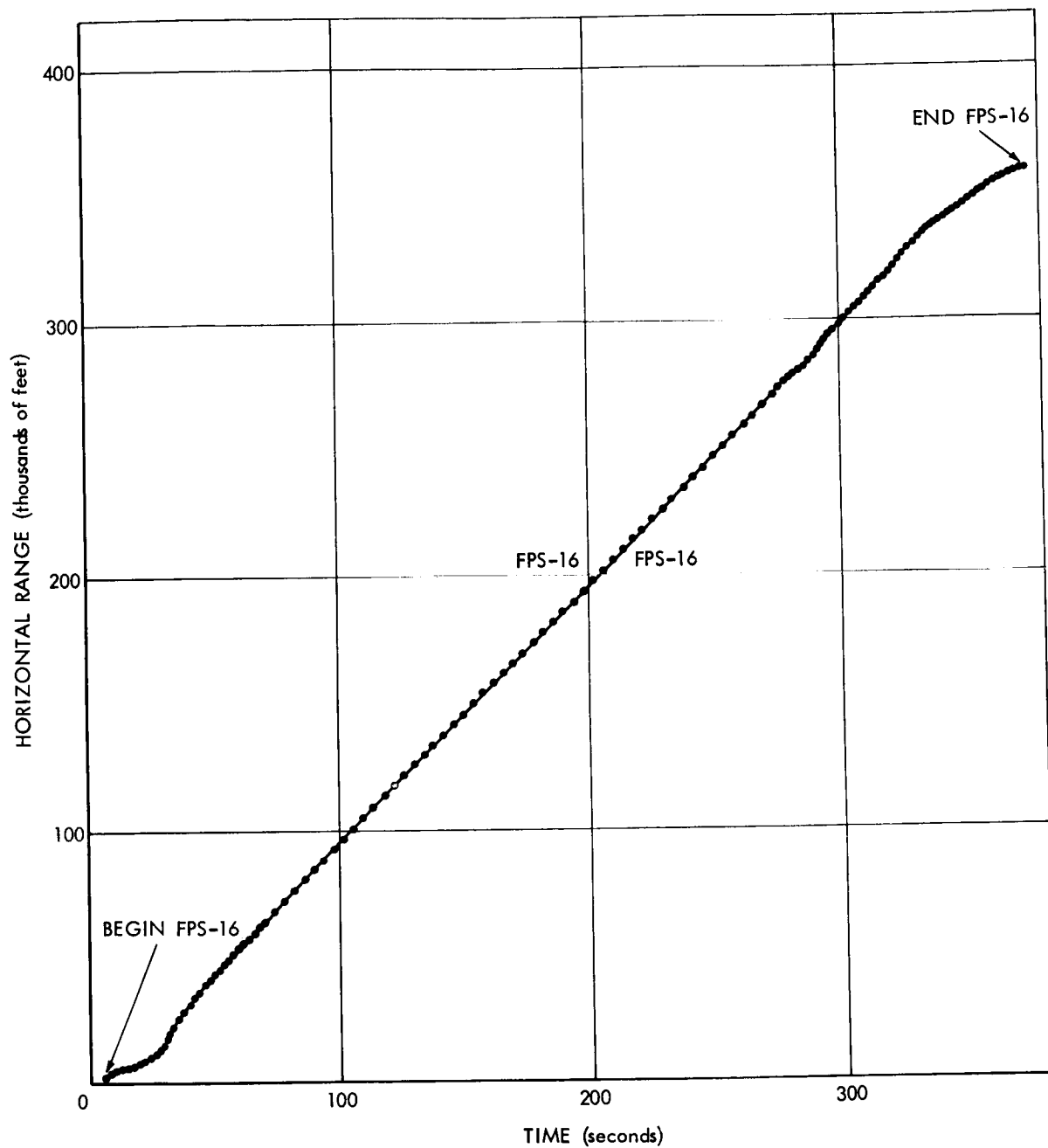


Figure 95. 14.74 CM Radar Plot, Horizontal Range vs Time

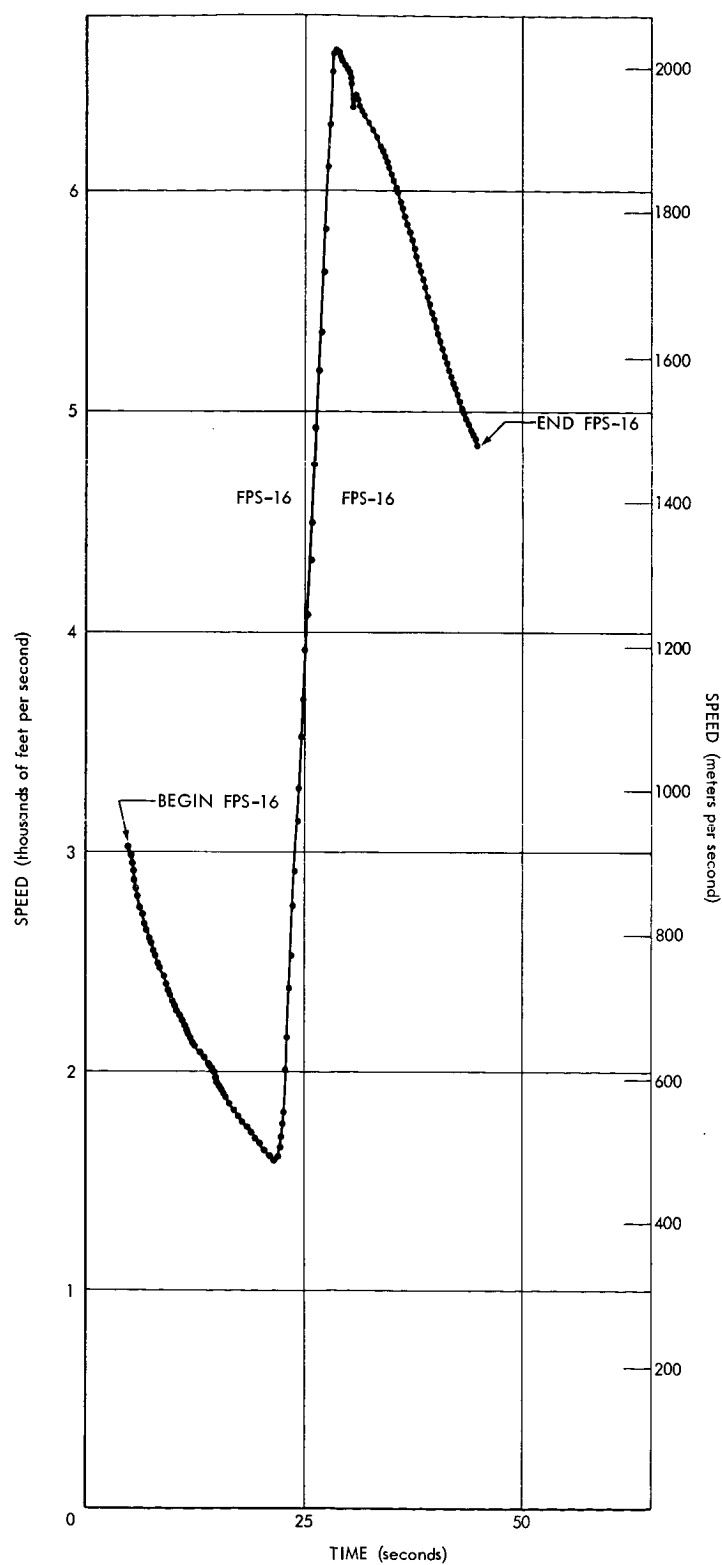


Figure 96. 14.74 CM Radar Plot, Speed vs Time

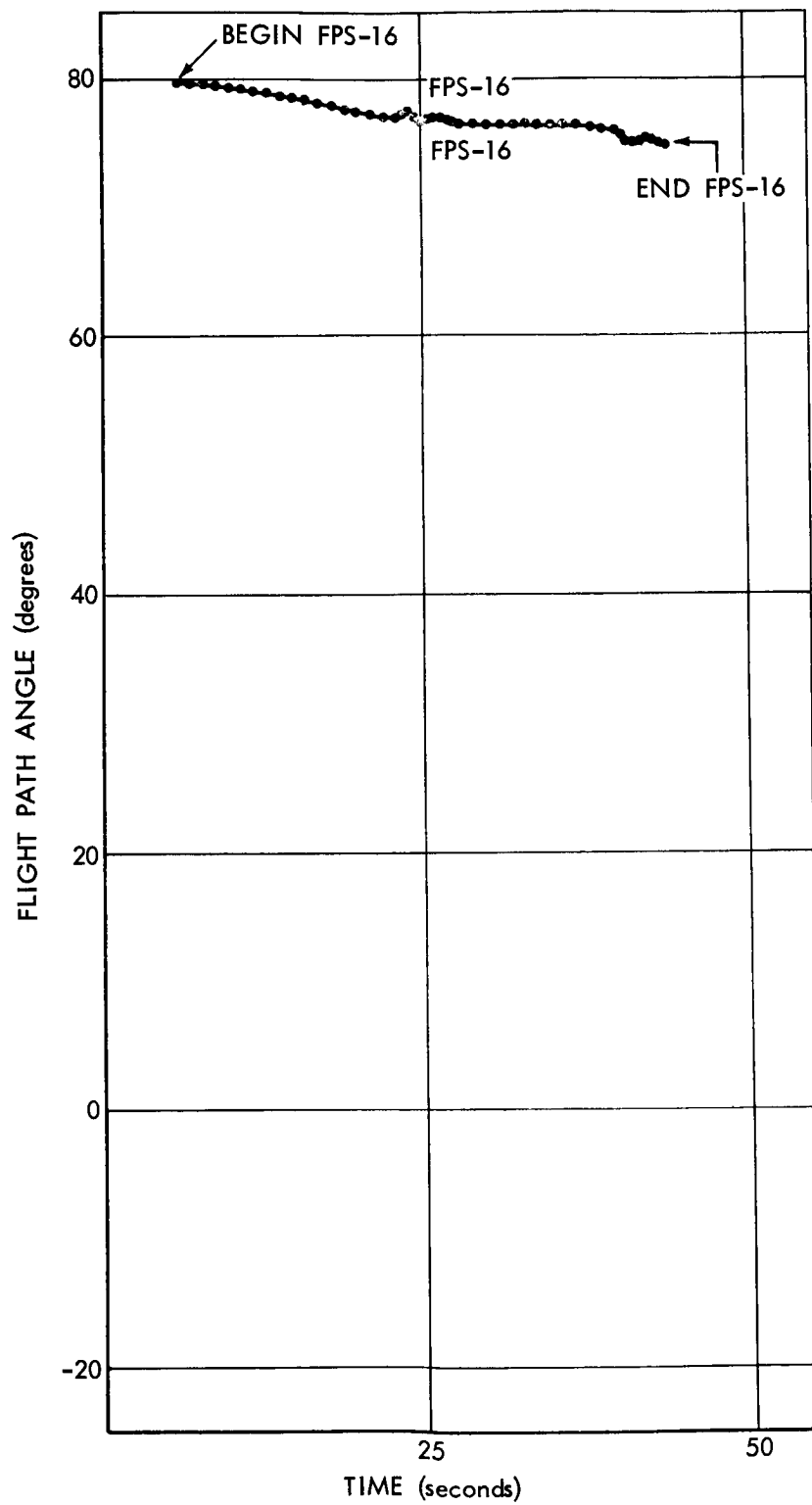


Figure 97. 14.74 CM Radar Plot, Flight Path Angle vs Time

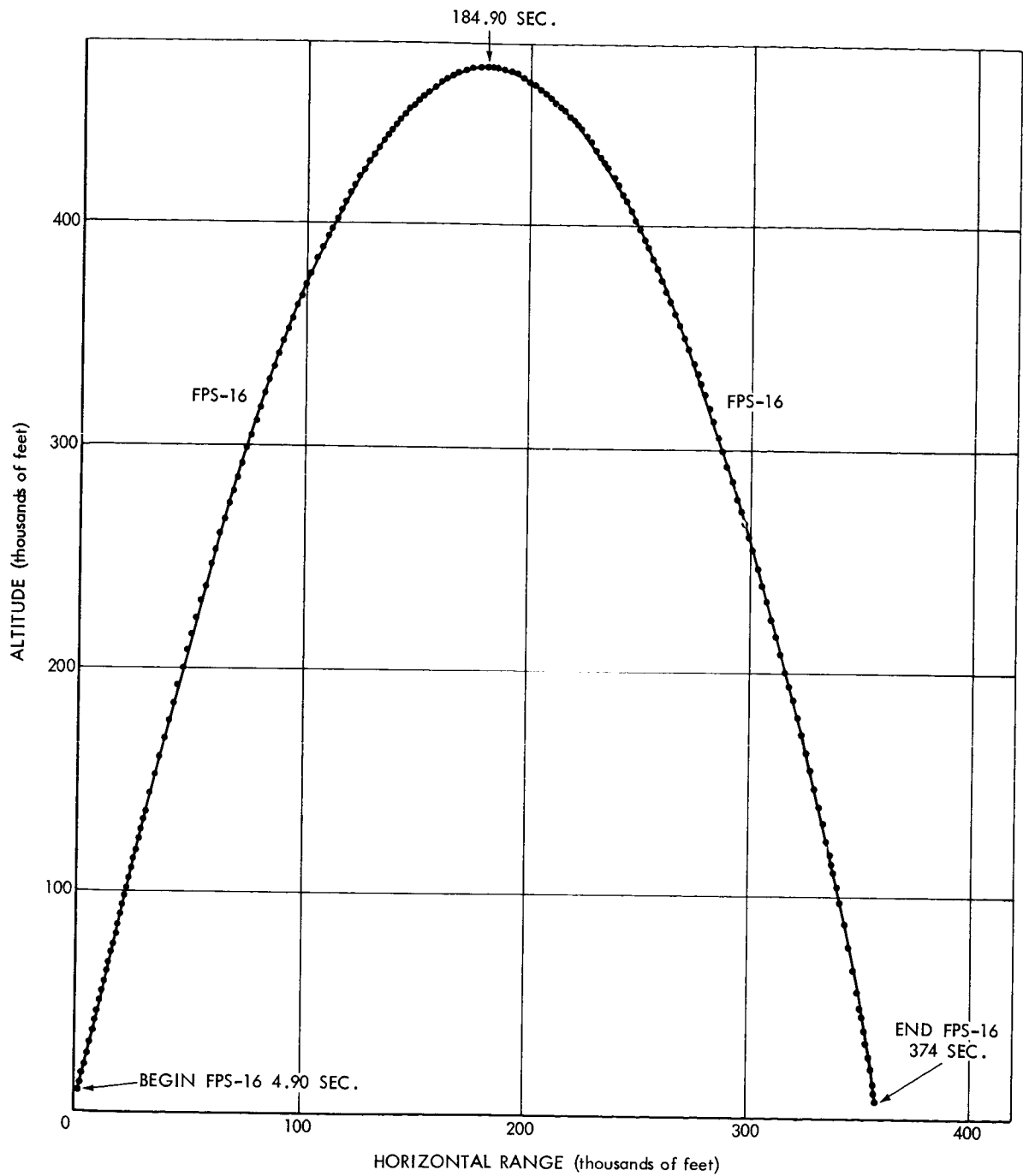


Figure 98. 14.74 CM Radar Plot, Altitude vs Horizontal Range

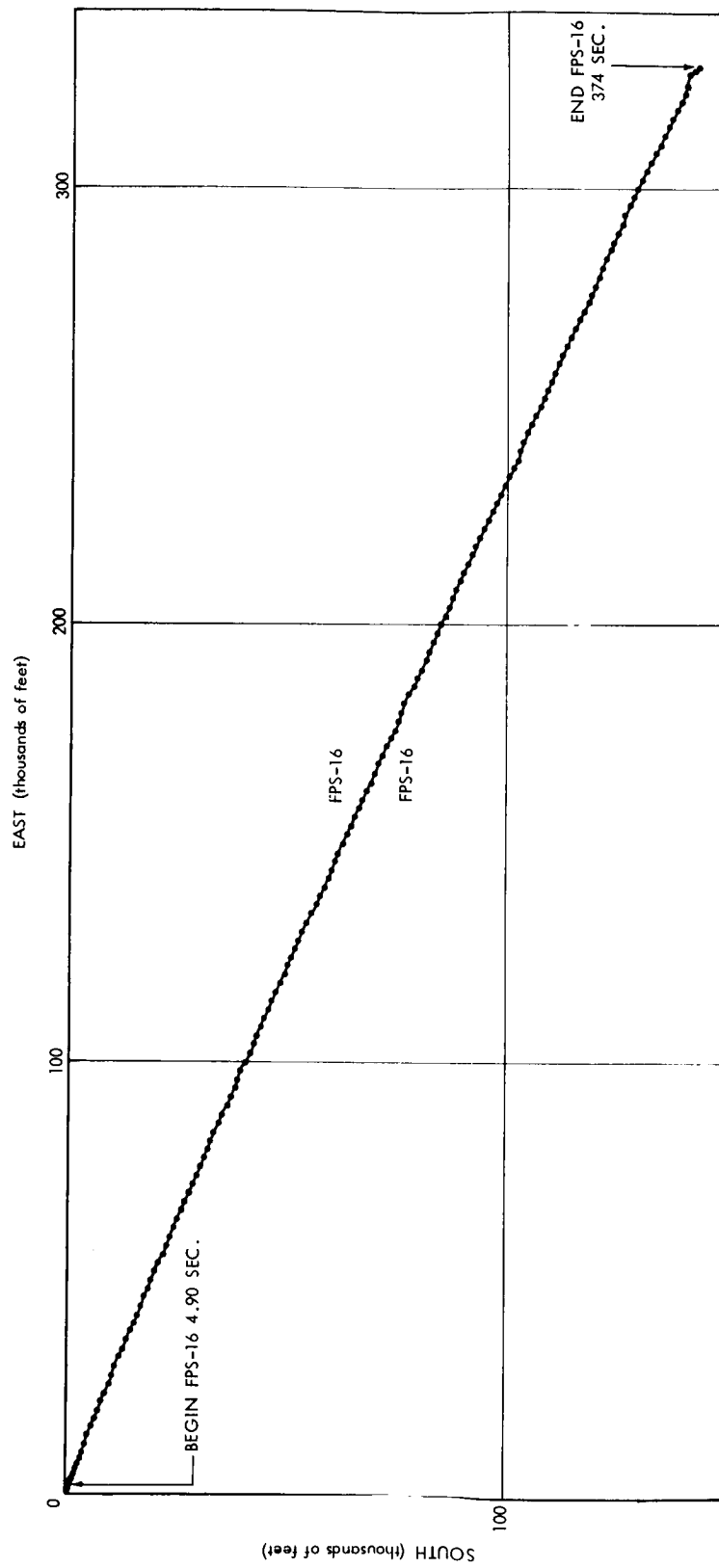


Figure 99. 14.74 CM Radar Plot, South Range vs East Range

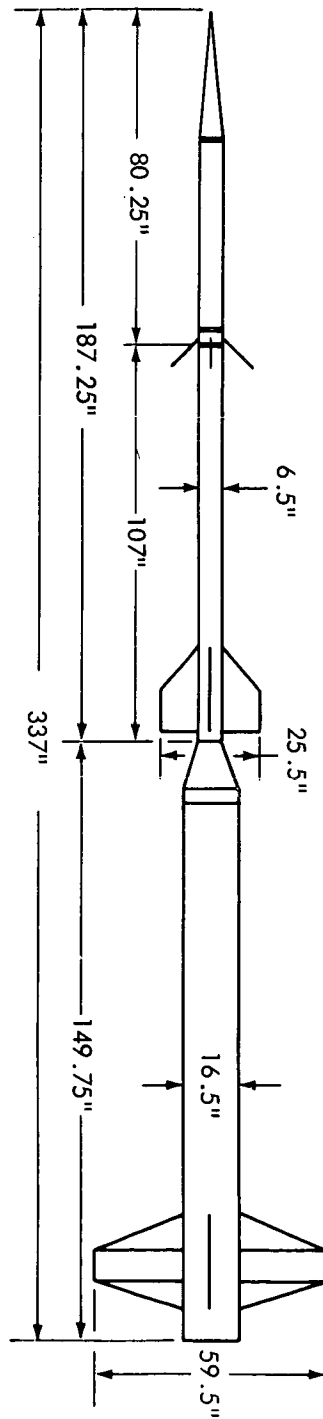


Figure 100. 14:83 UE Sketch

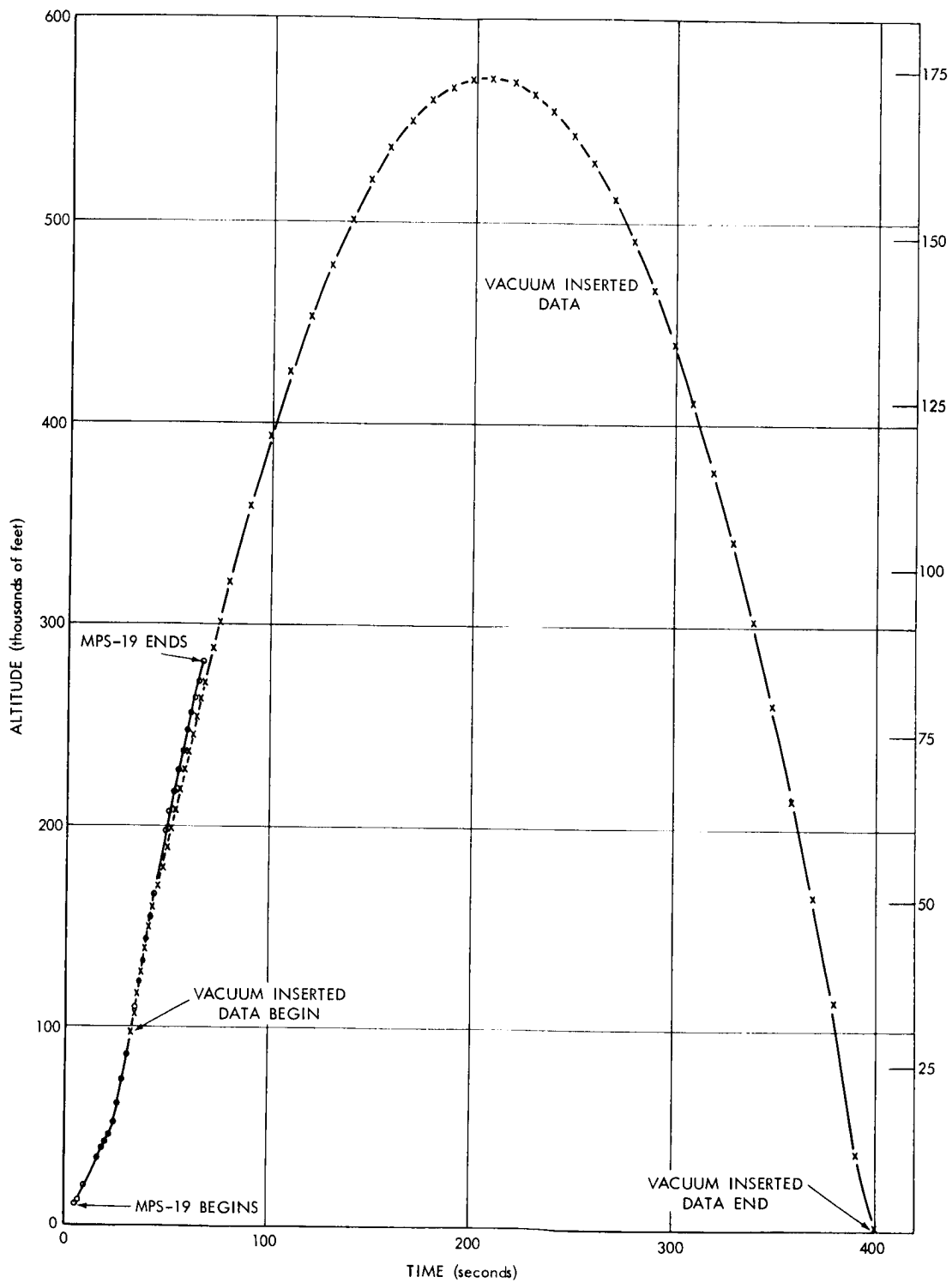


Figure 101. 14.83 UE Radar Plot, Altitude vs Time



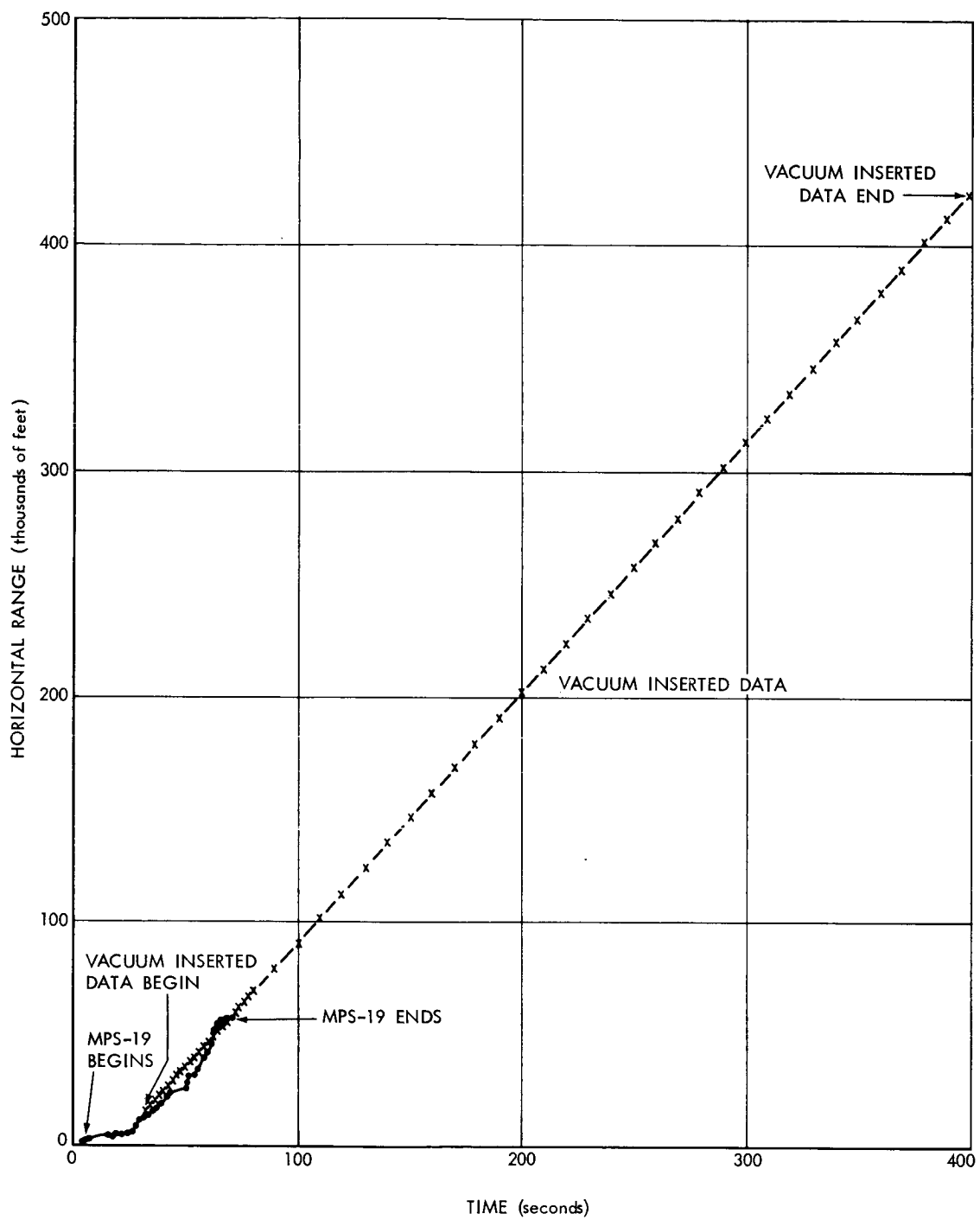


Figure 102. 14.83 UE Radar Plot, Horizontal Range vs Time

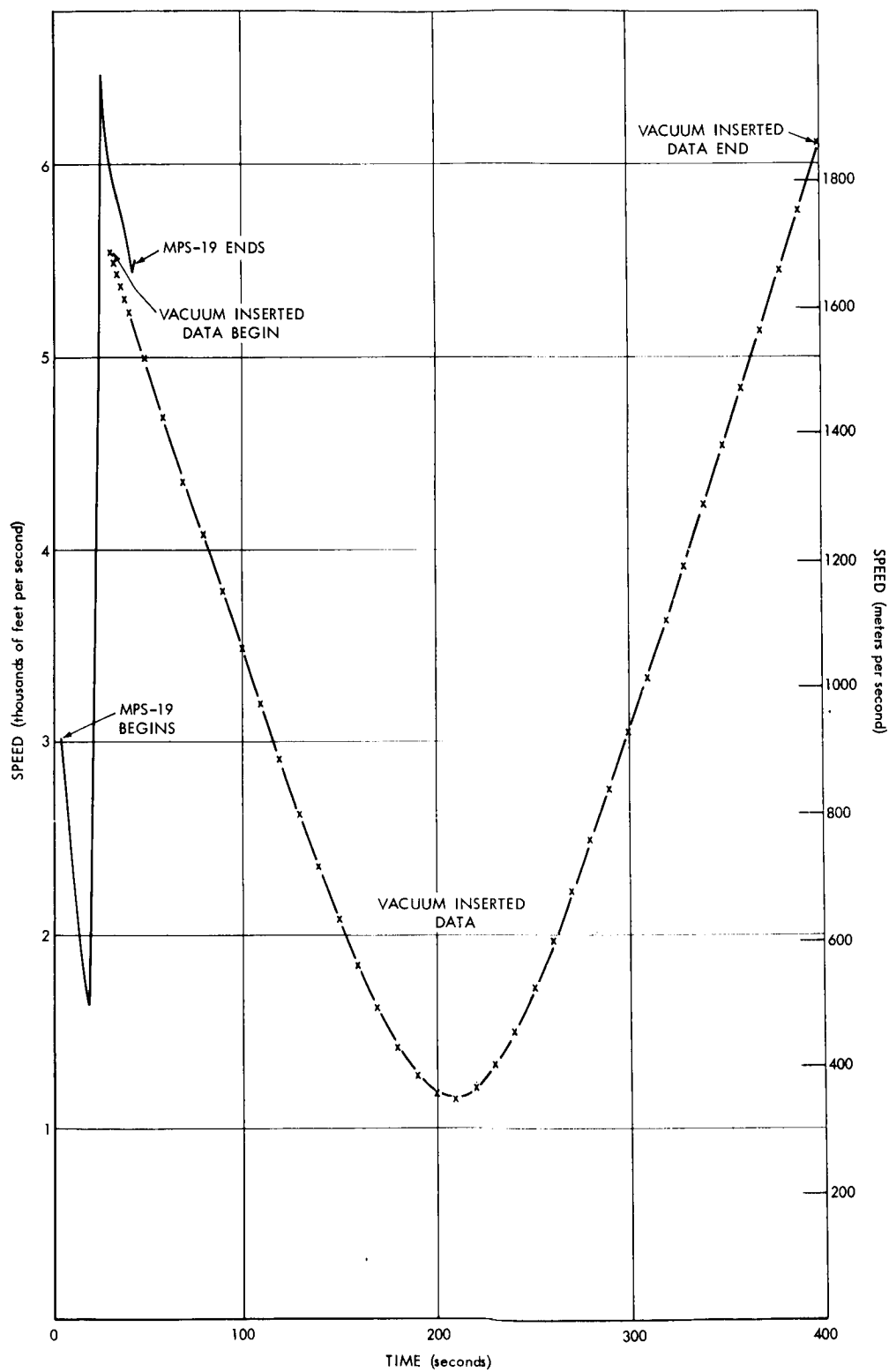


Figure 103. 14.83 UE Radar Plot, Speed vs Time

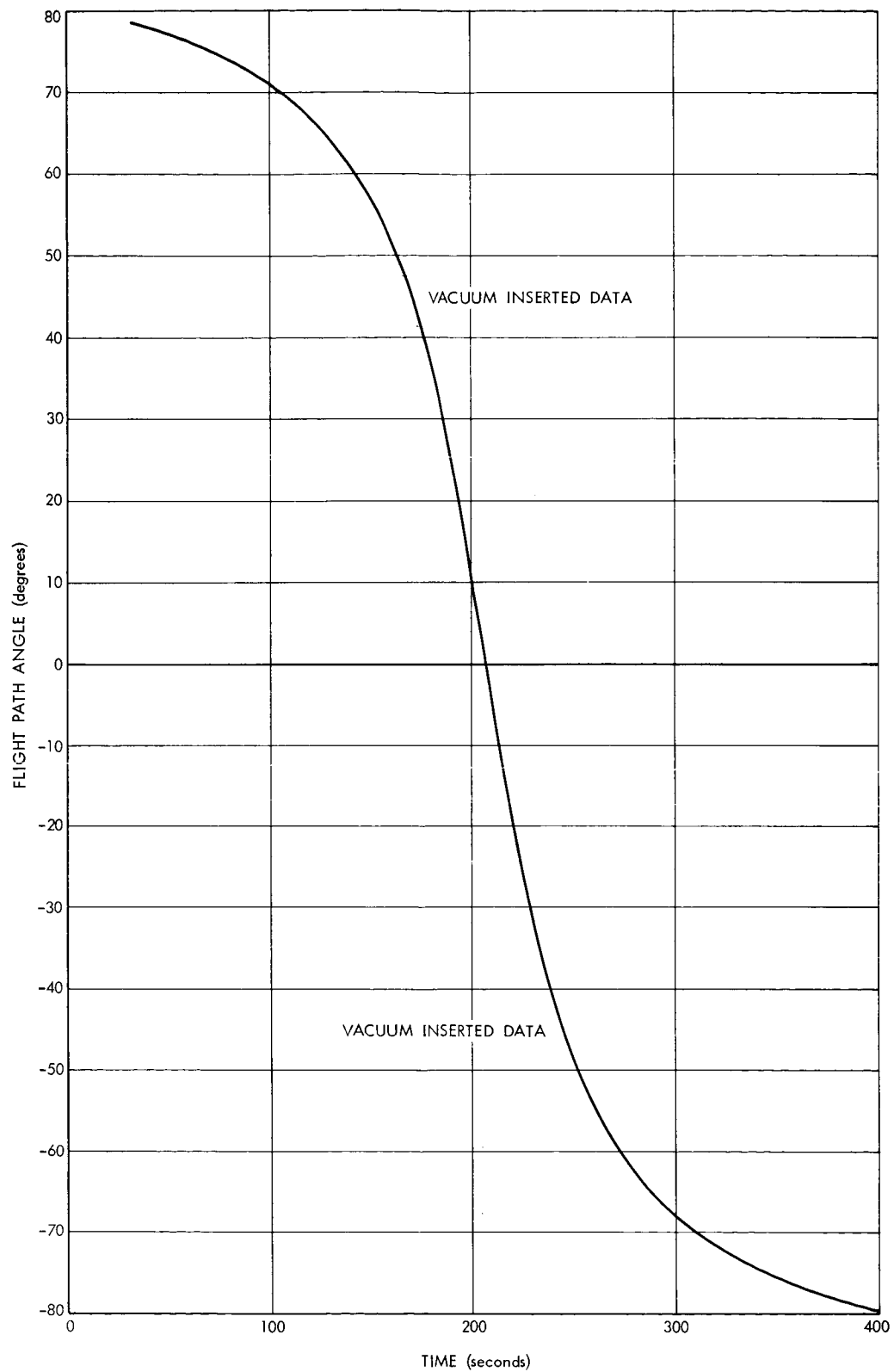


Figure 104. 14.83 UE Radar Plot, Flight Path Angle vs Time

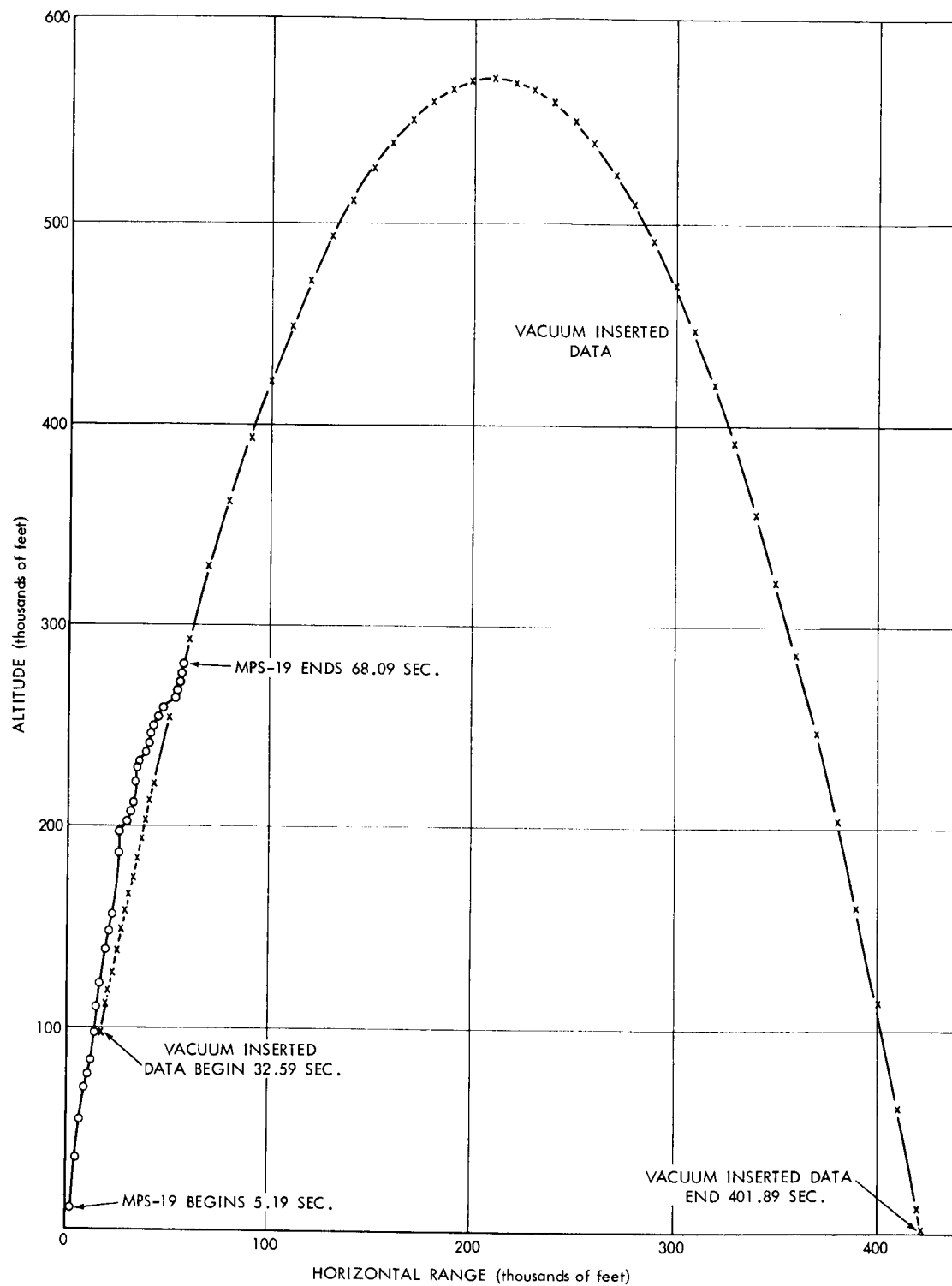


Figure 105. 14.83 UE Radar Plot, Altitude vs Horizontal Range

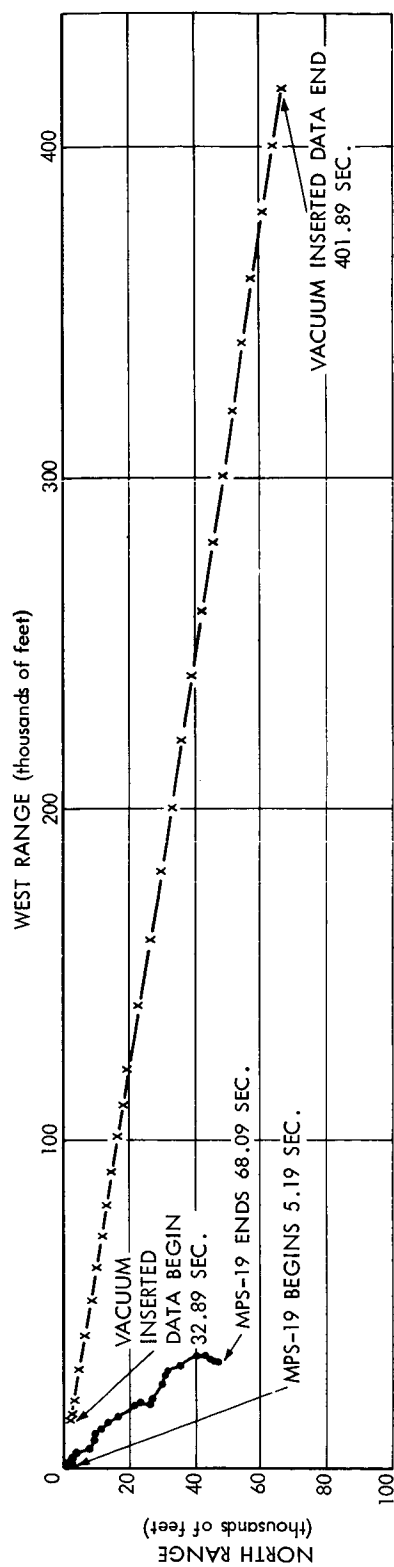


Figure 106. 14.83 UE Radar Plot, North Range vs West Range

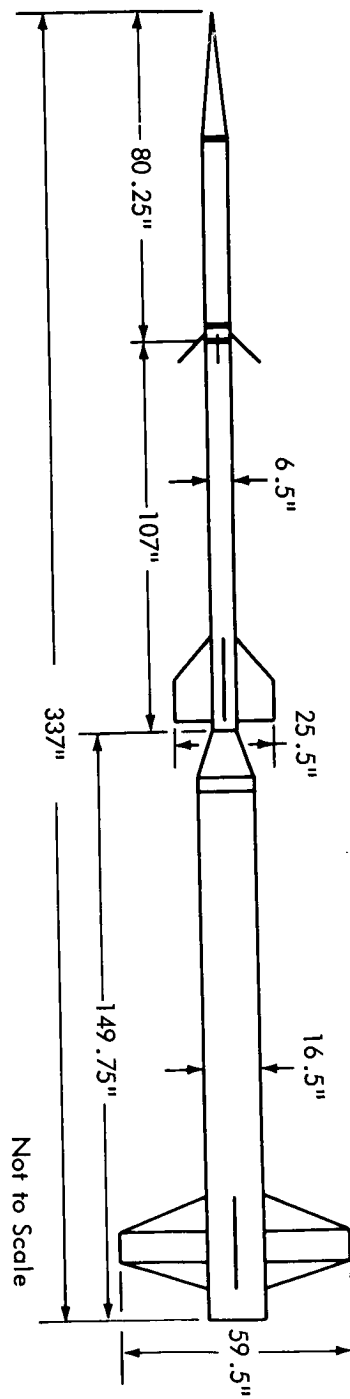


Figure 107. 14.84 UE Sketch

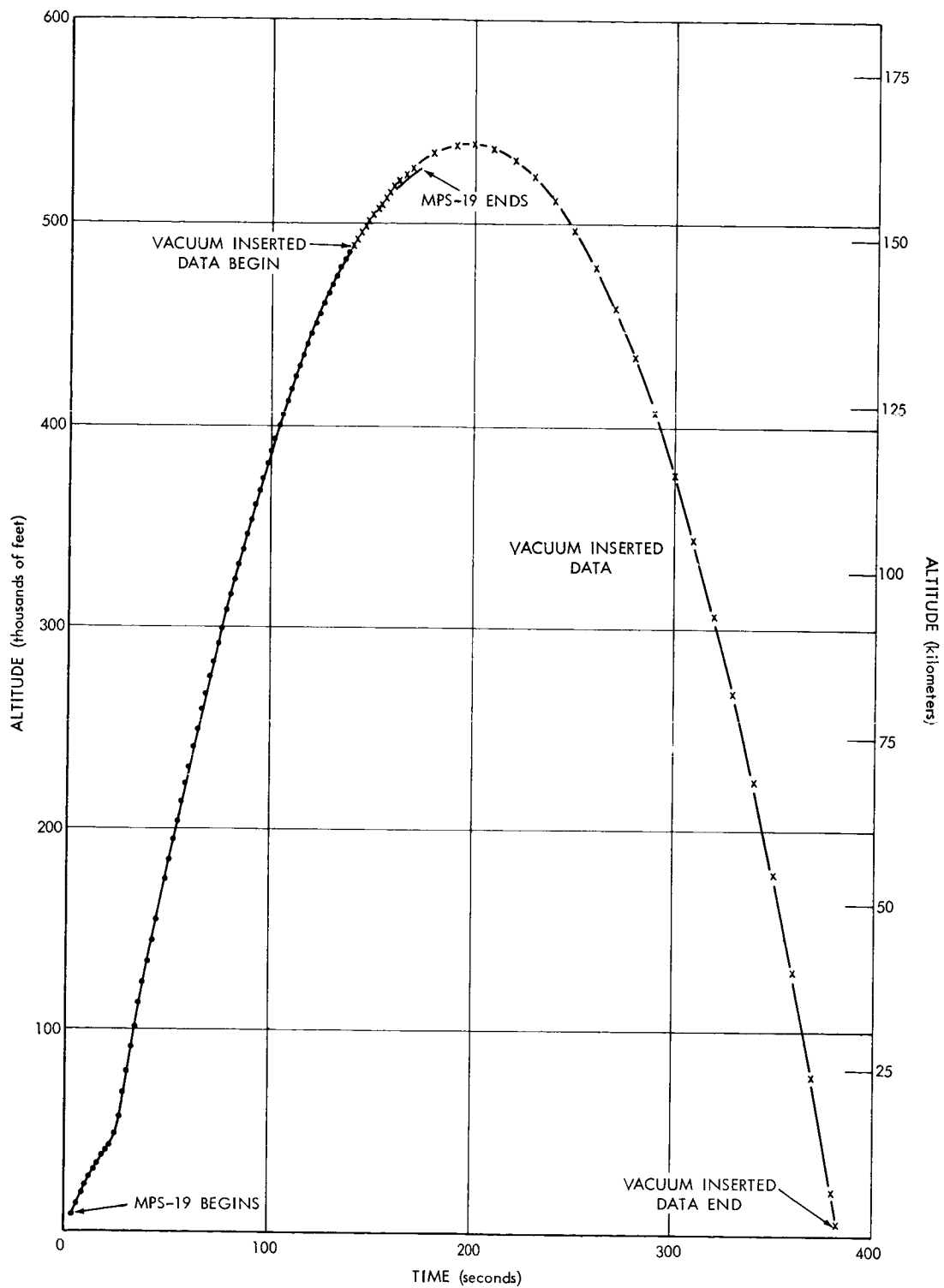


Figure 108. 14.84 UE Radar Plot, Altitude vs Time

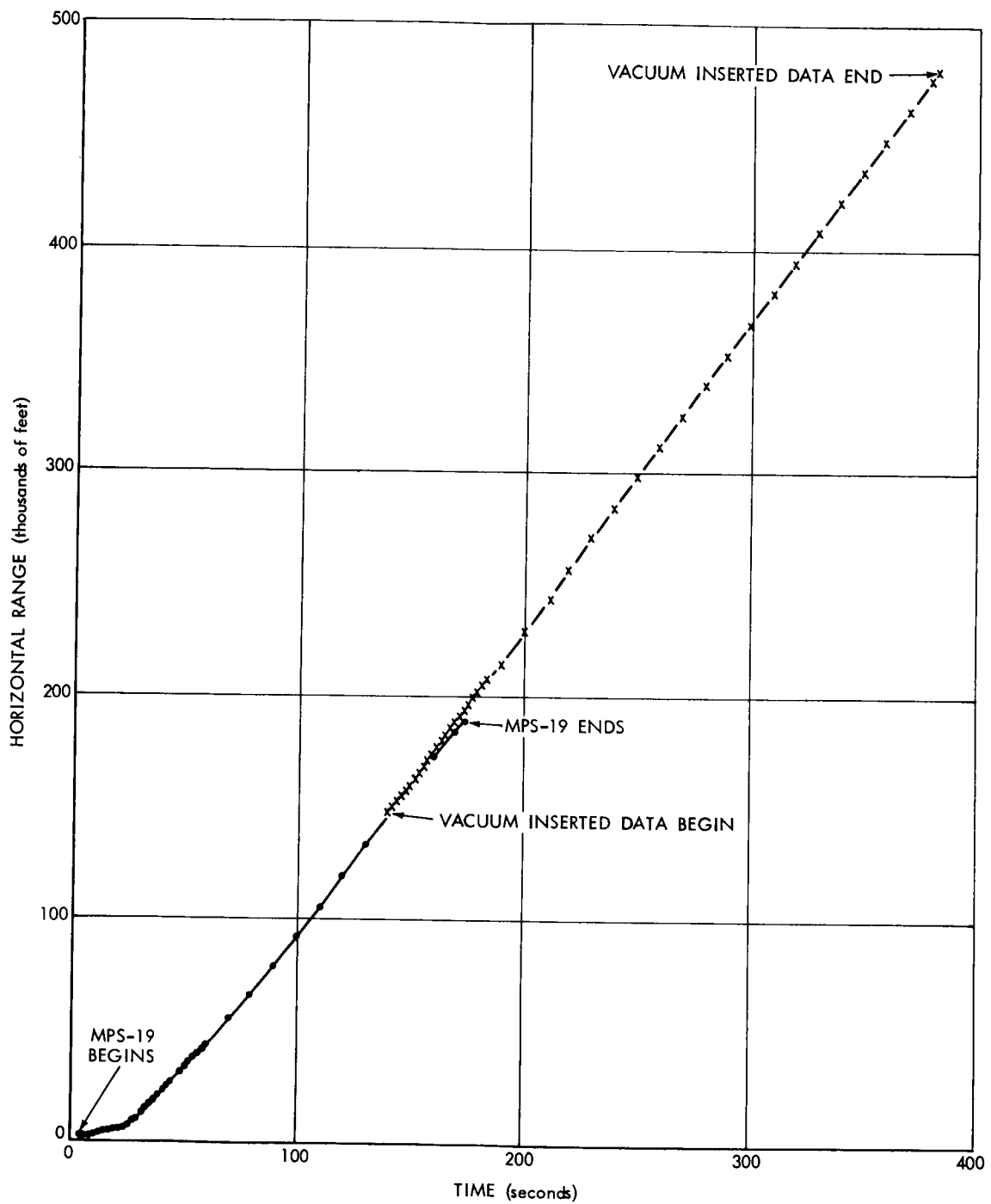


Figure 109. 14.84 UE Radar Plot, Horizontal Range vs Time



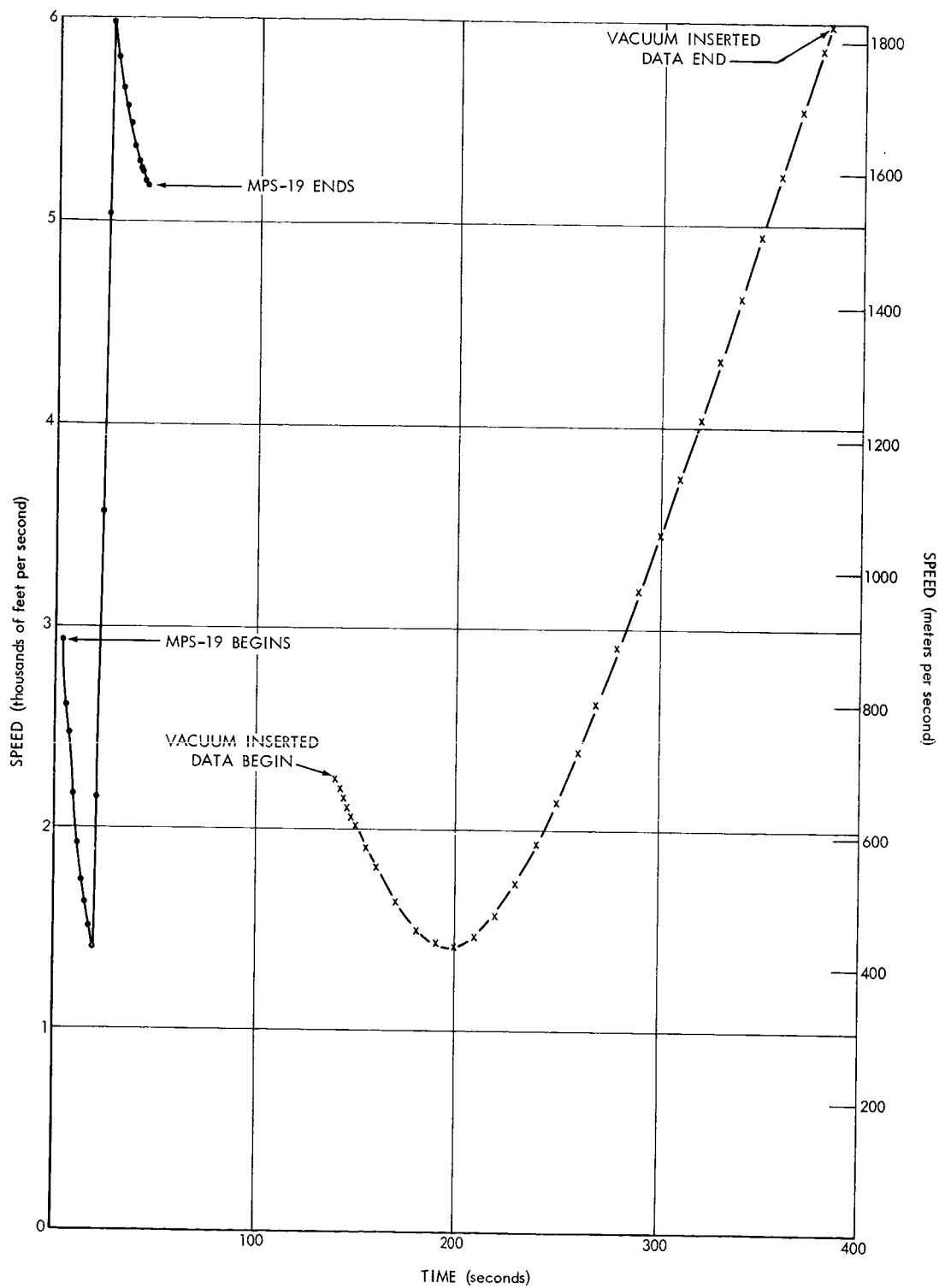


Figure 110. 14.84 UE Radar Plot, Speed vs Time

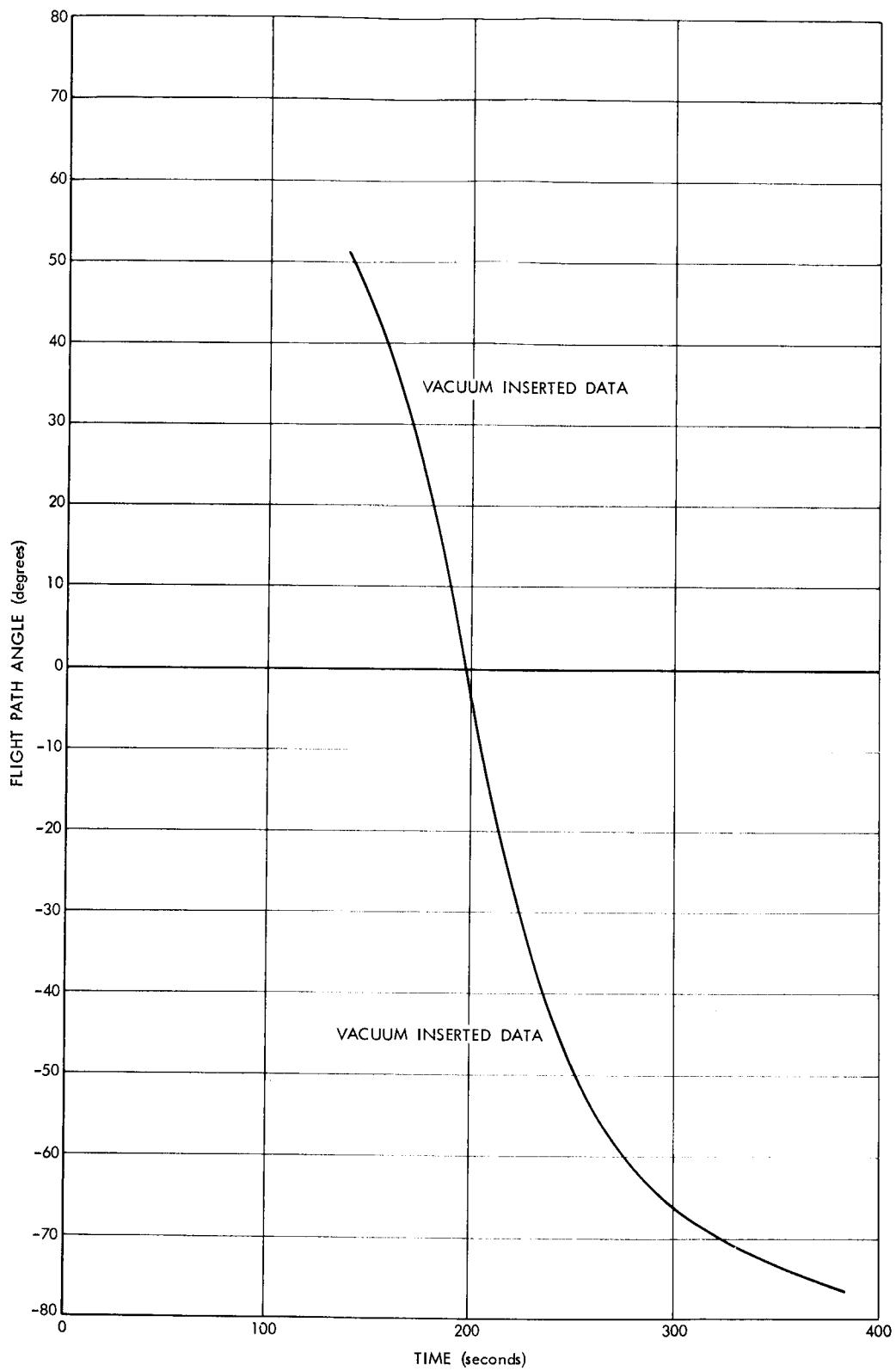


Figure 111. 14.84 UE Radar Plot, Flight Path Angle vs Time

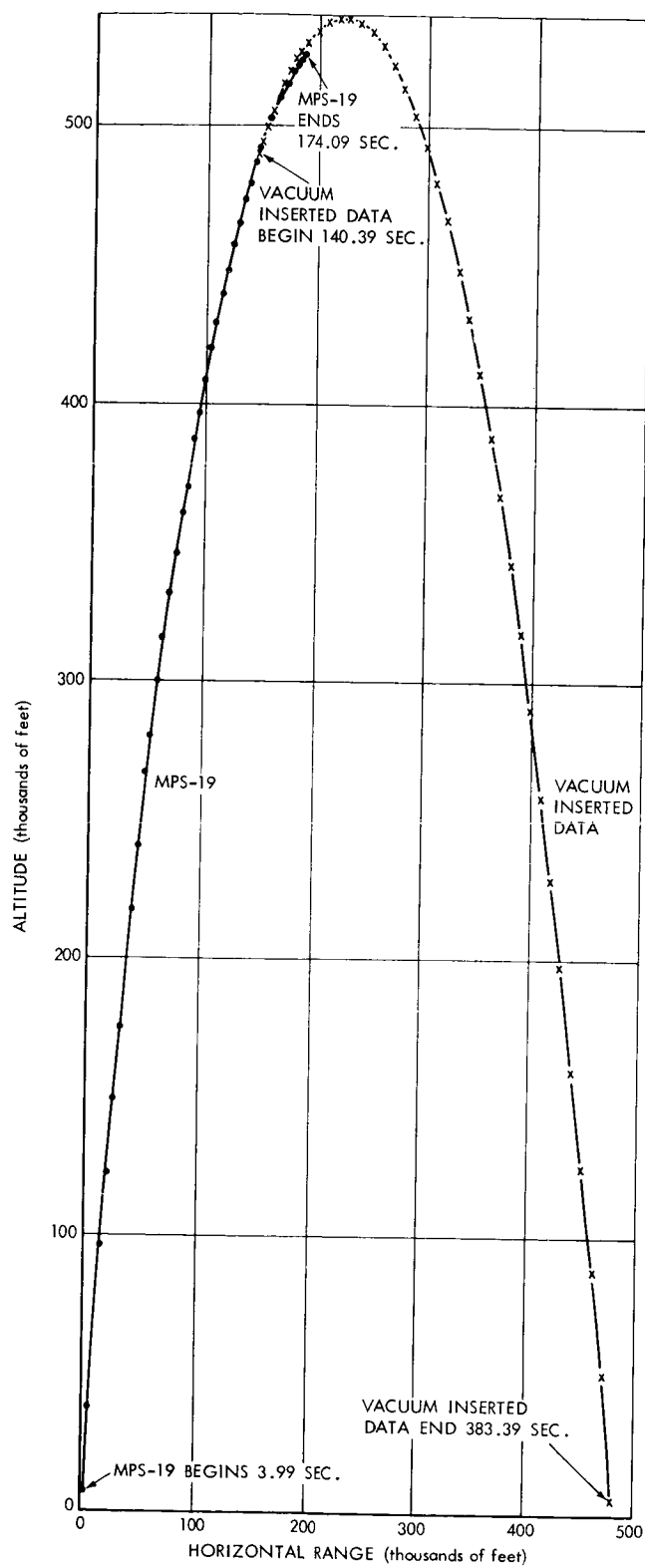


Figure 112. 14.84 UE Radar Plot, Altitude vs Horizontal Range

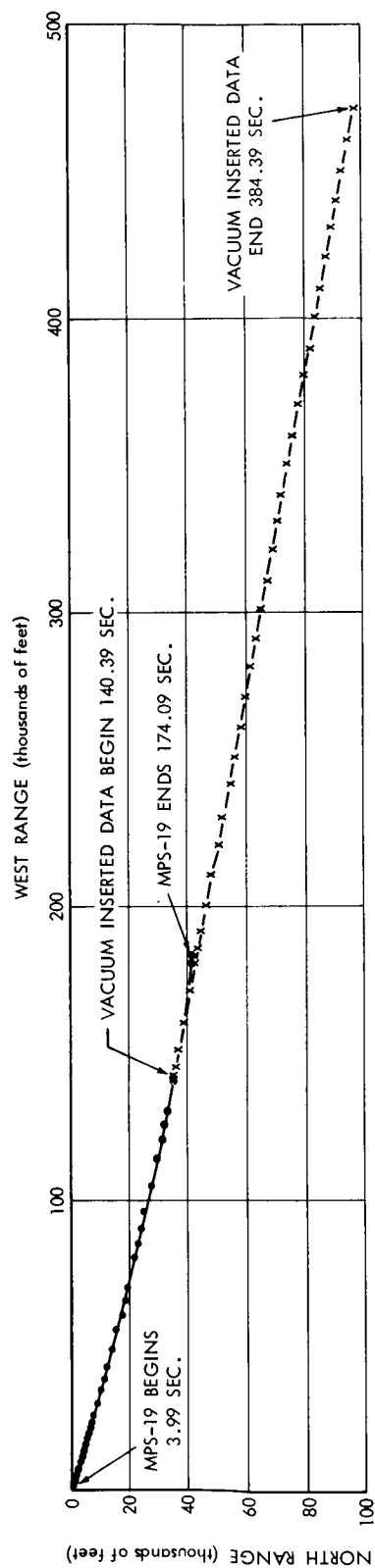


Figure 113. 14.84 UE Radar Plot, North Range vs West Range

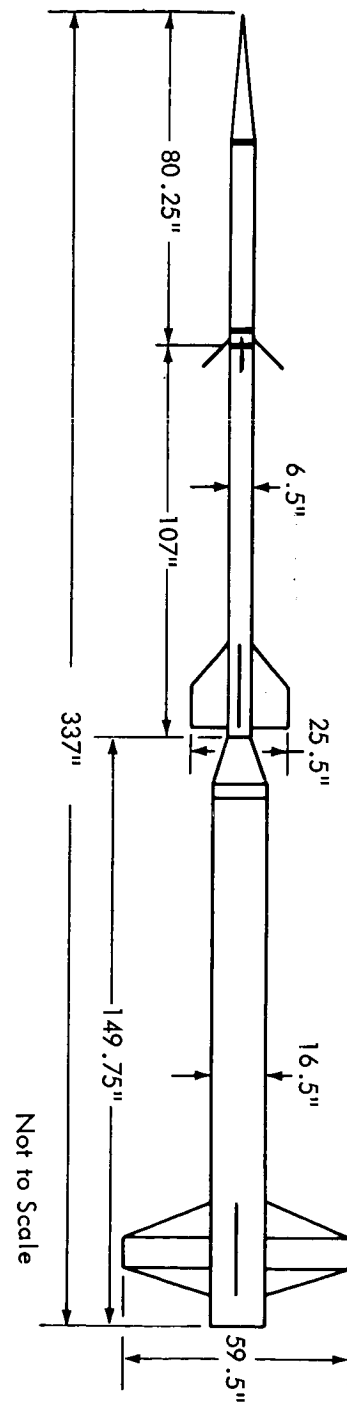


Figure 114. 14.85 UE Sketch

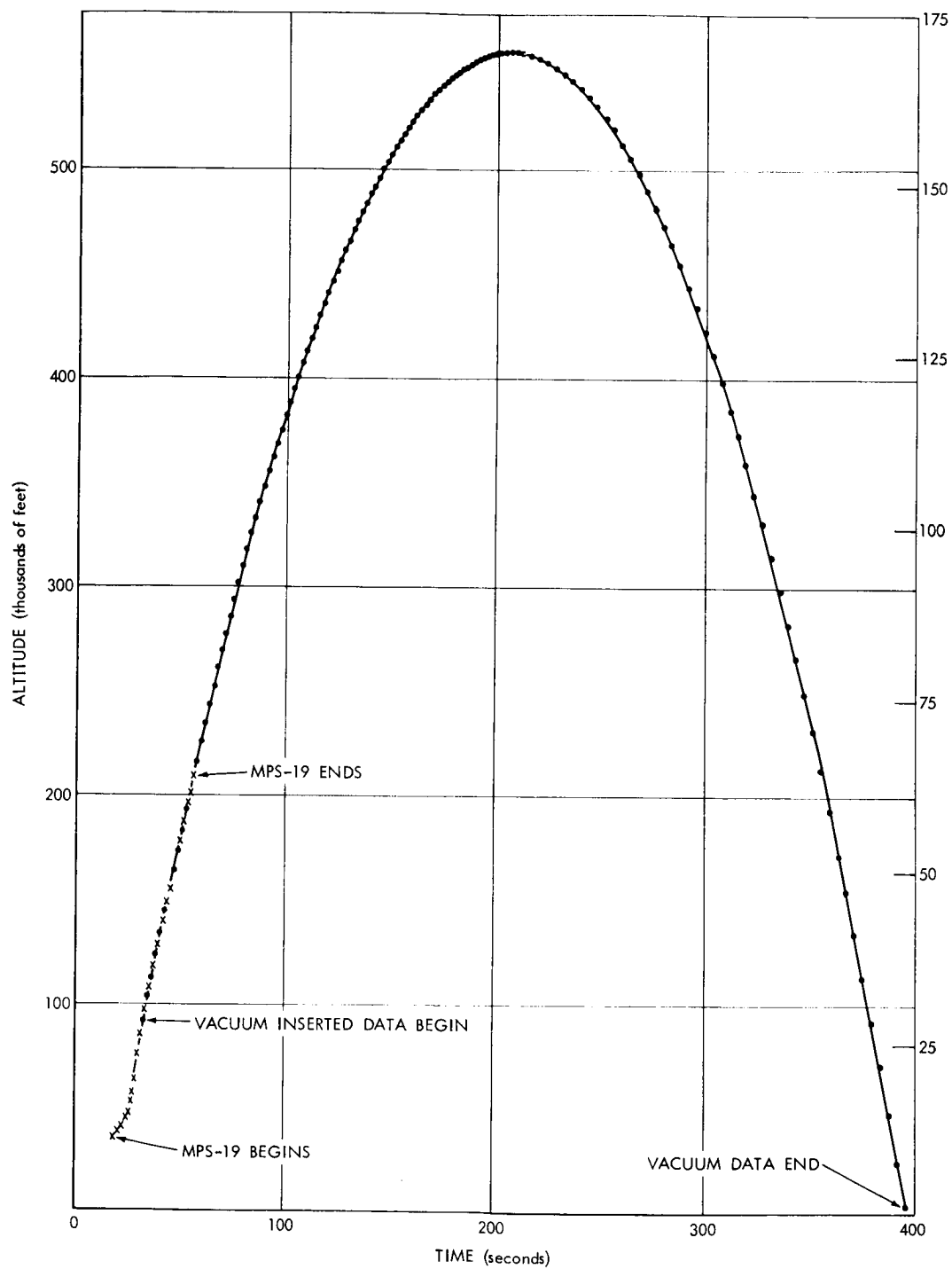


Figure 115. 14.85 UE Radar Plot, Altitude vs Time

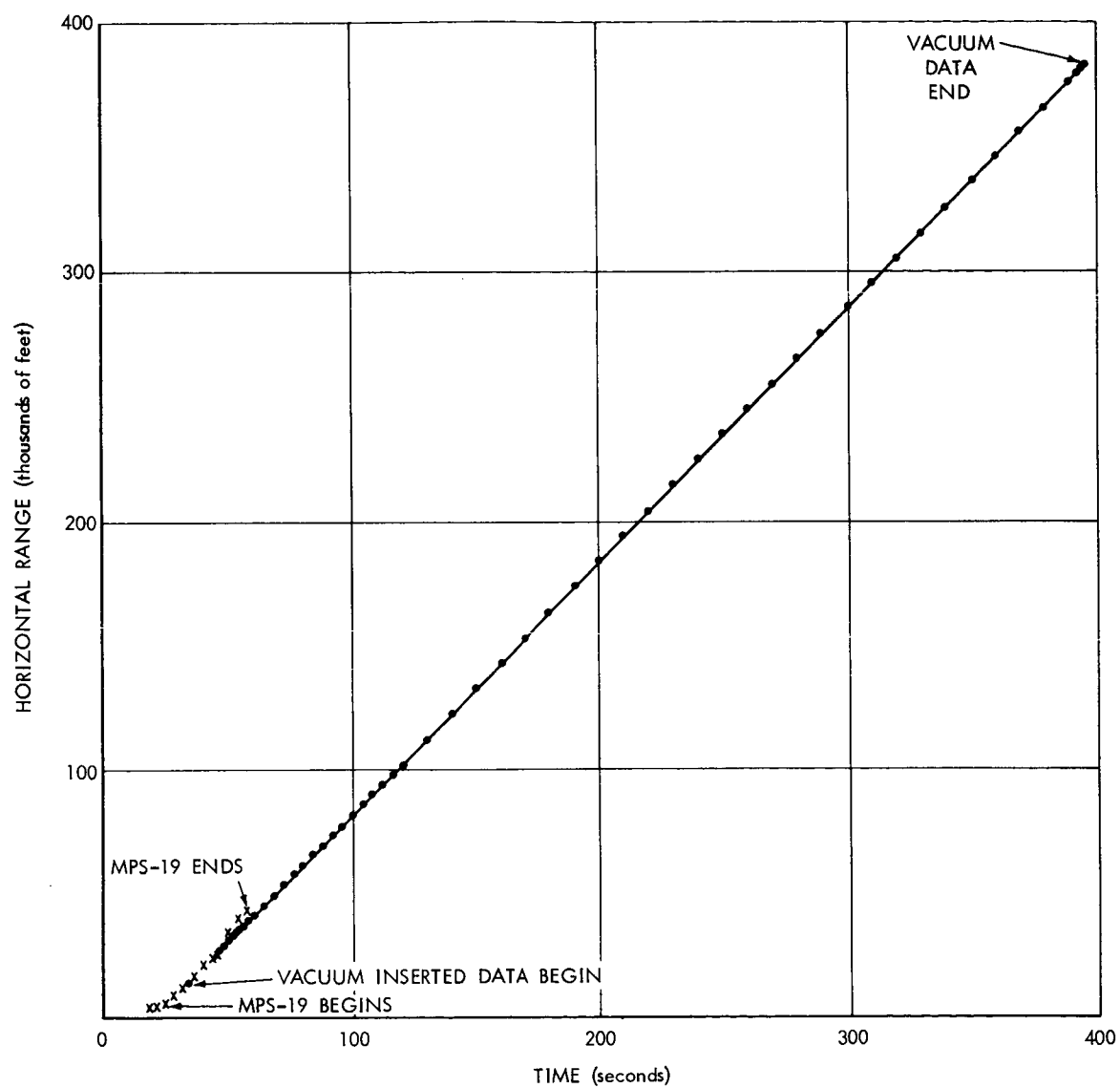


Figure 116. 14.85 UE Radar Plot, Horizontal Range vs Time

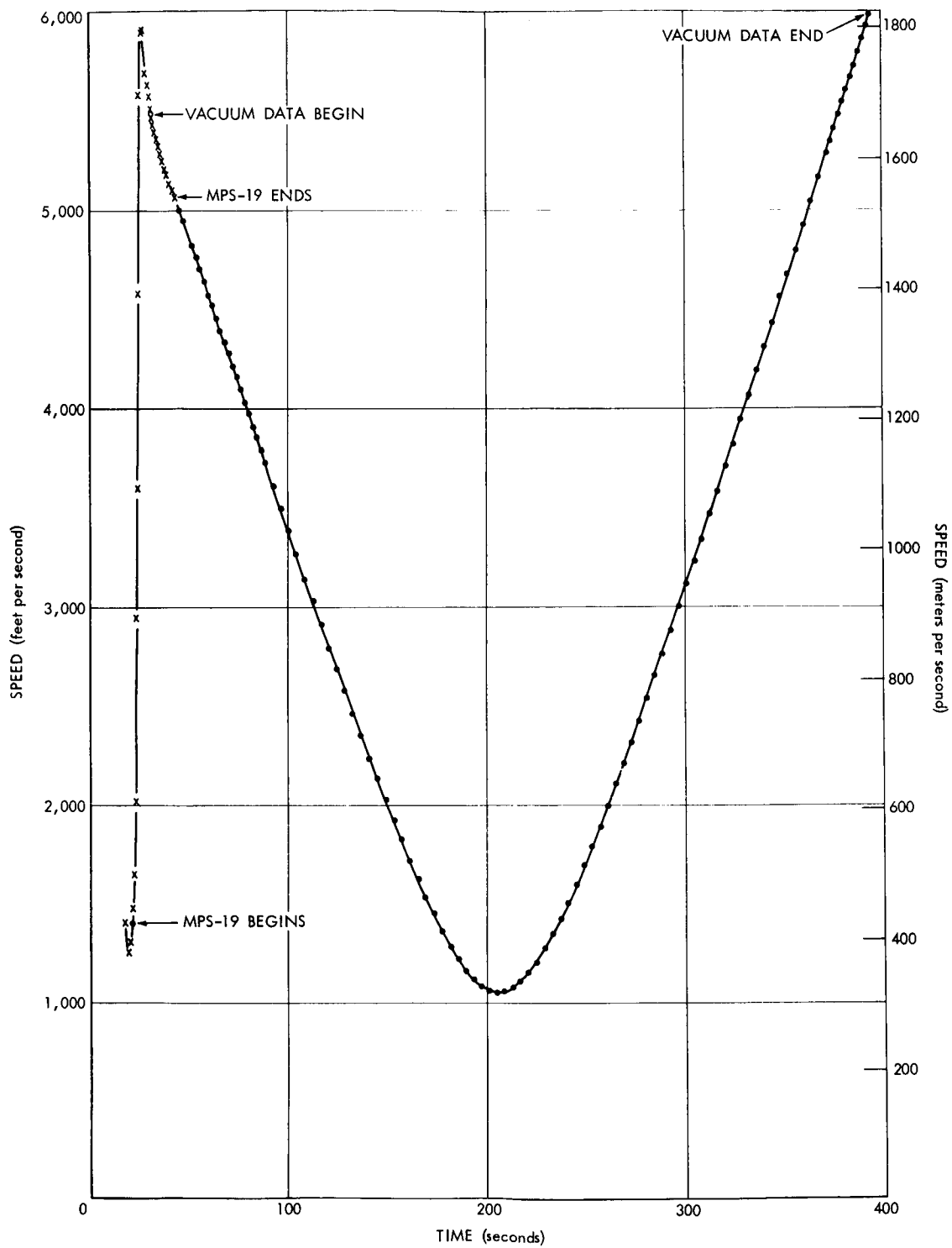


Figure 117. 14.85 UE Radar Plot, Speed vs Time



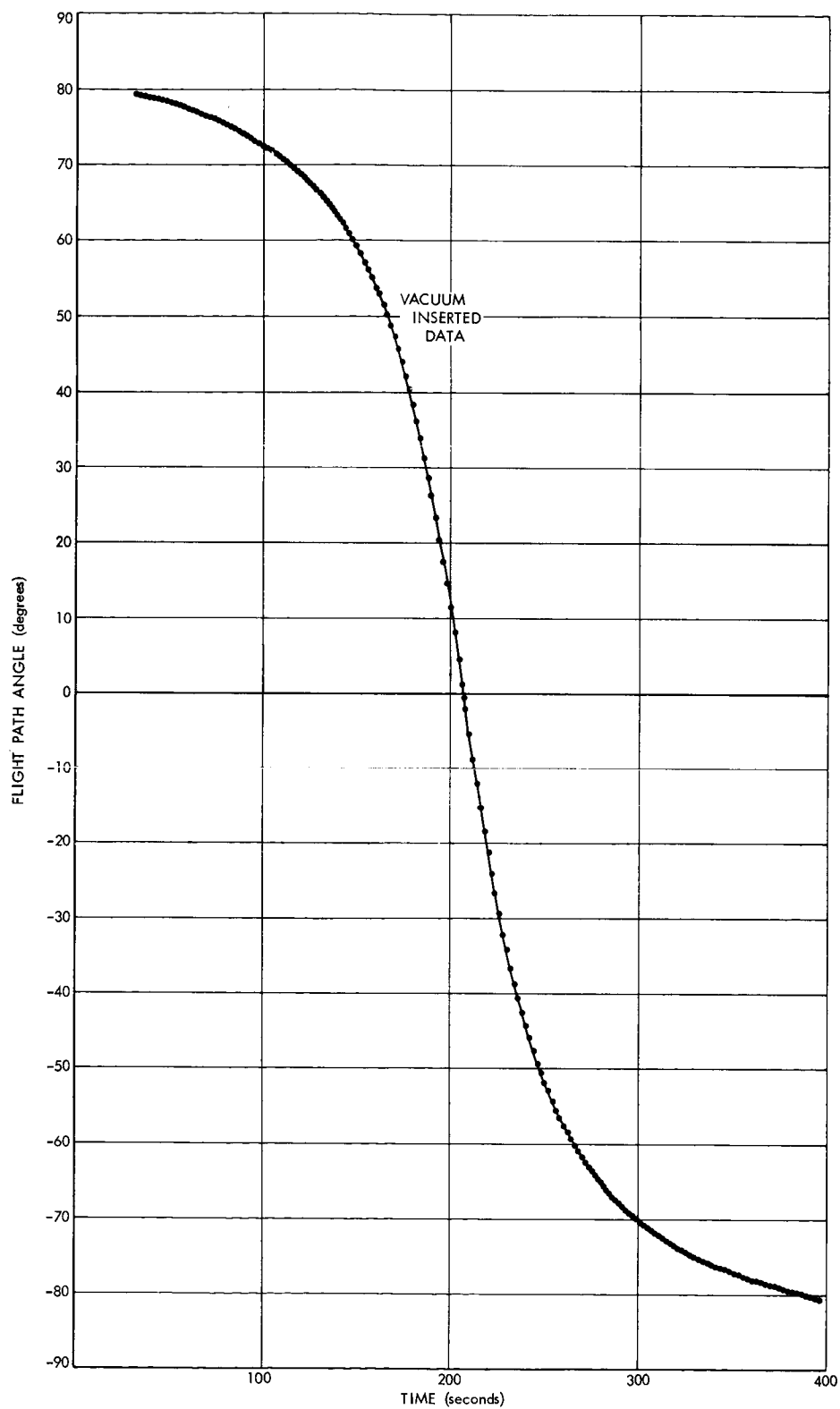


Figure 118. 14.85 UE Radar Plot, Flight Path Angle vs Time

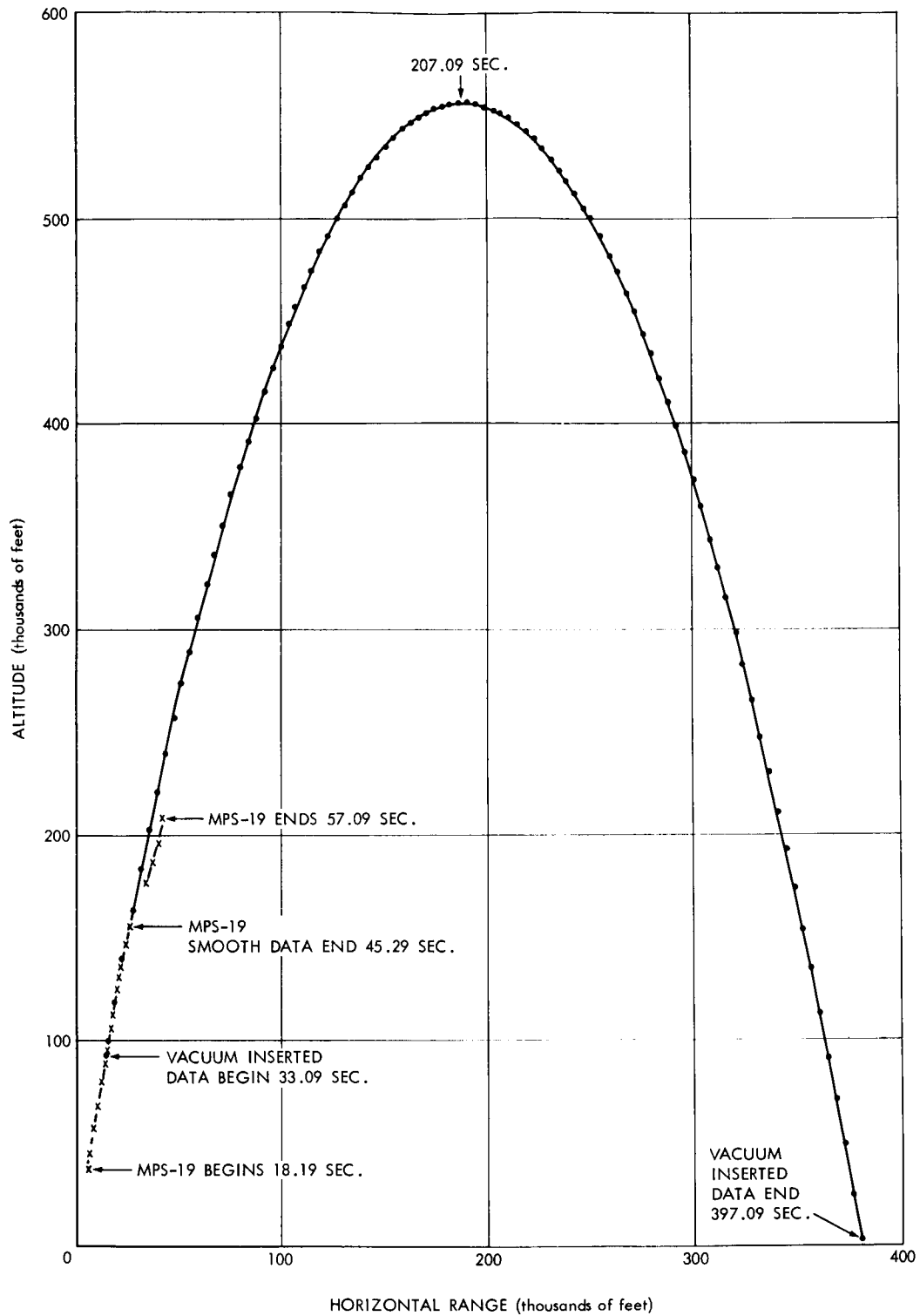


Figure 119. 14.85 UE Radar Plot, Altitude vs Horizontal Range

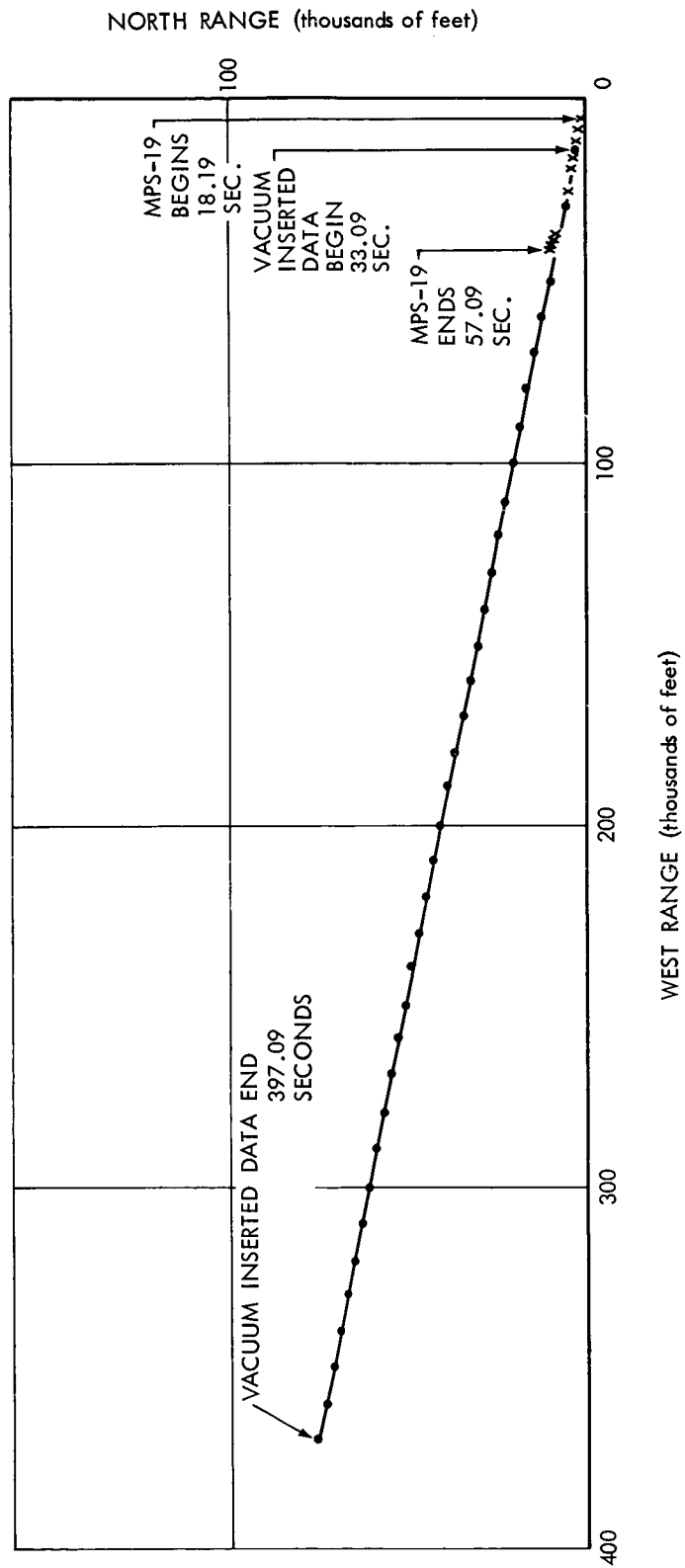


Figure 120. 14.85 UE Radar Plot, North Range vs West Range

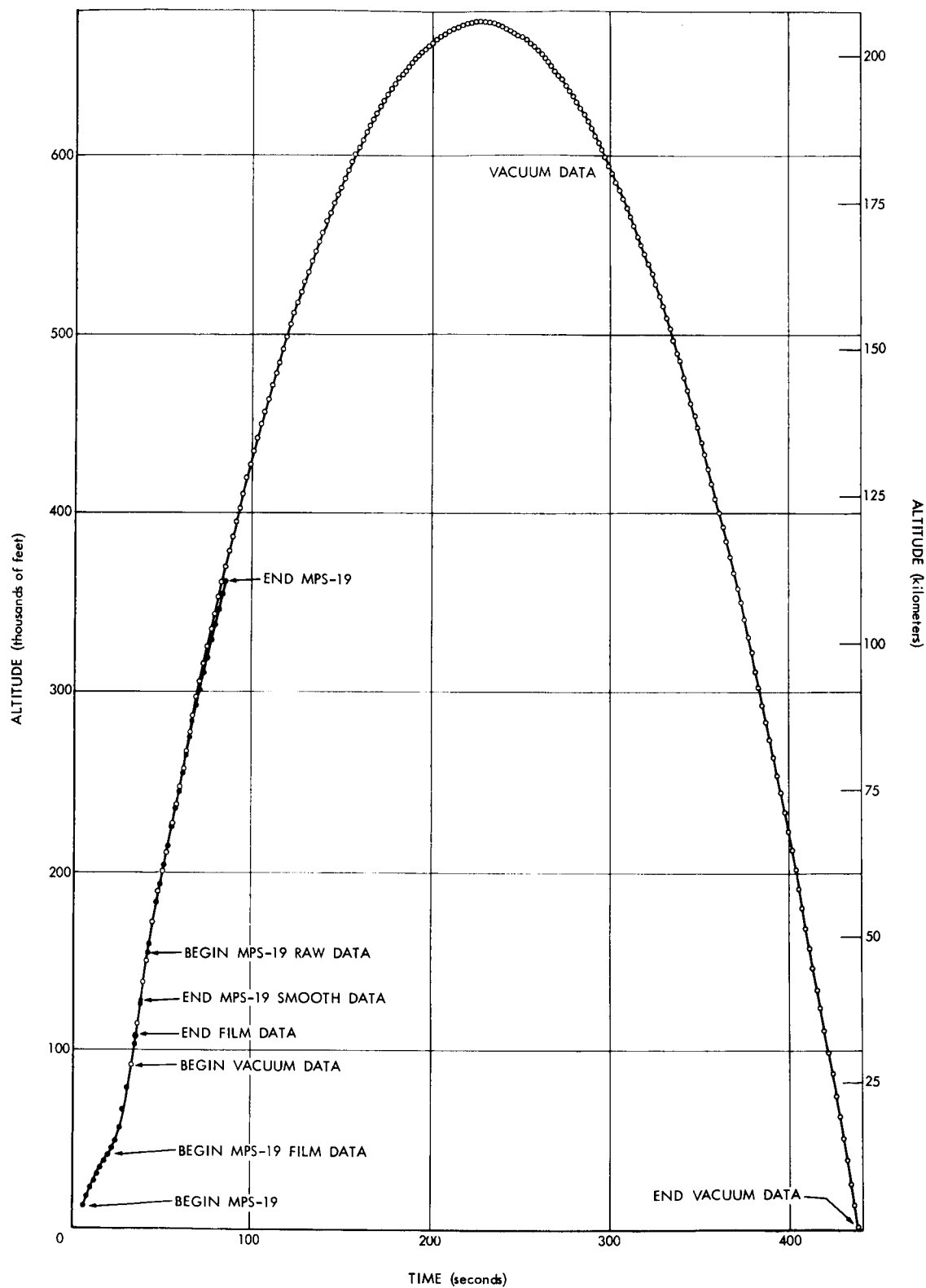


Figure 121. 14.98 UA Radar Plot, Altitude vs Time  
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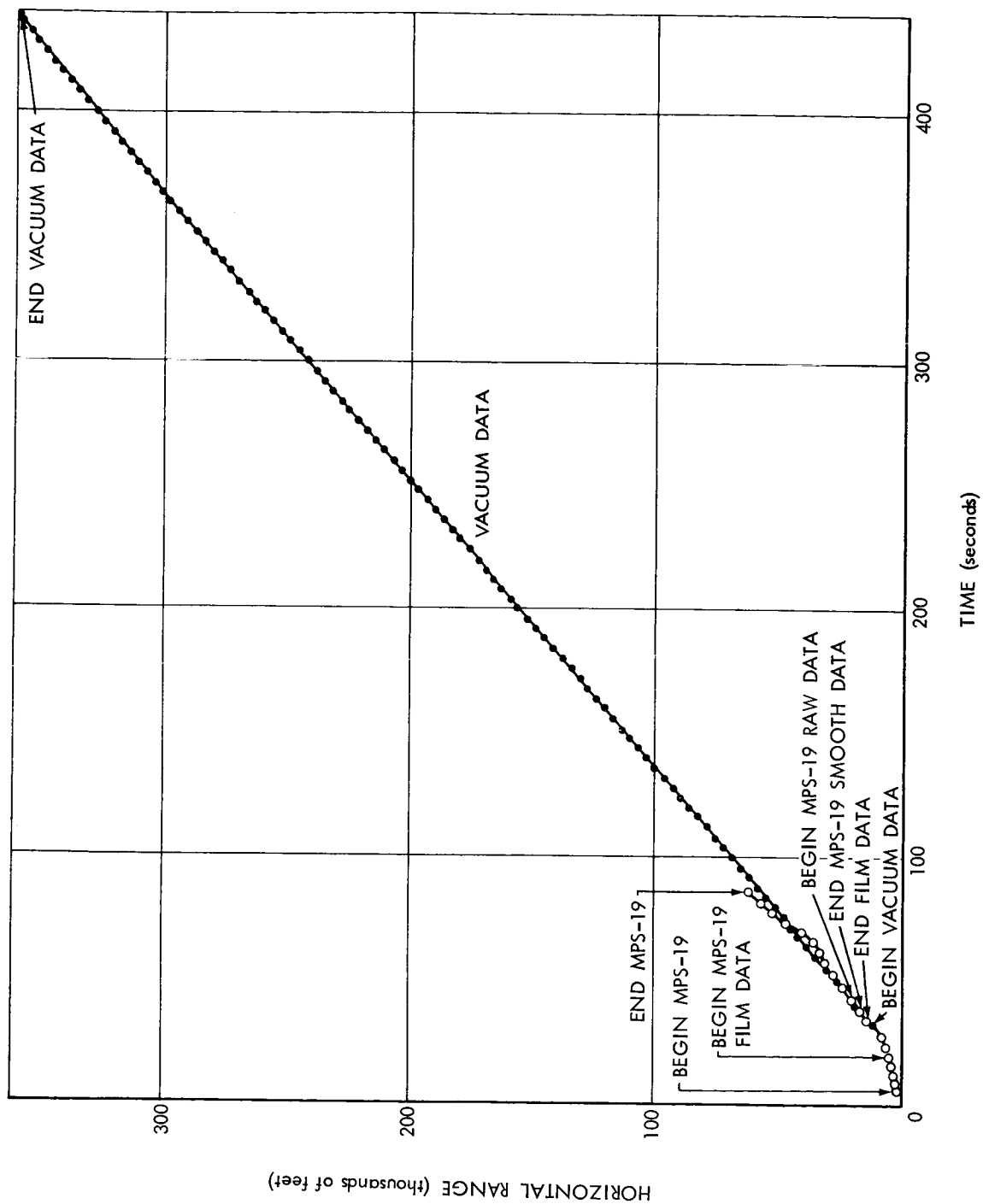


Figure 122. 14.98 UA Radar Plot, Horizontal Range vs Time

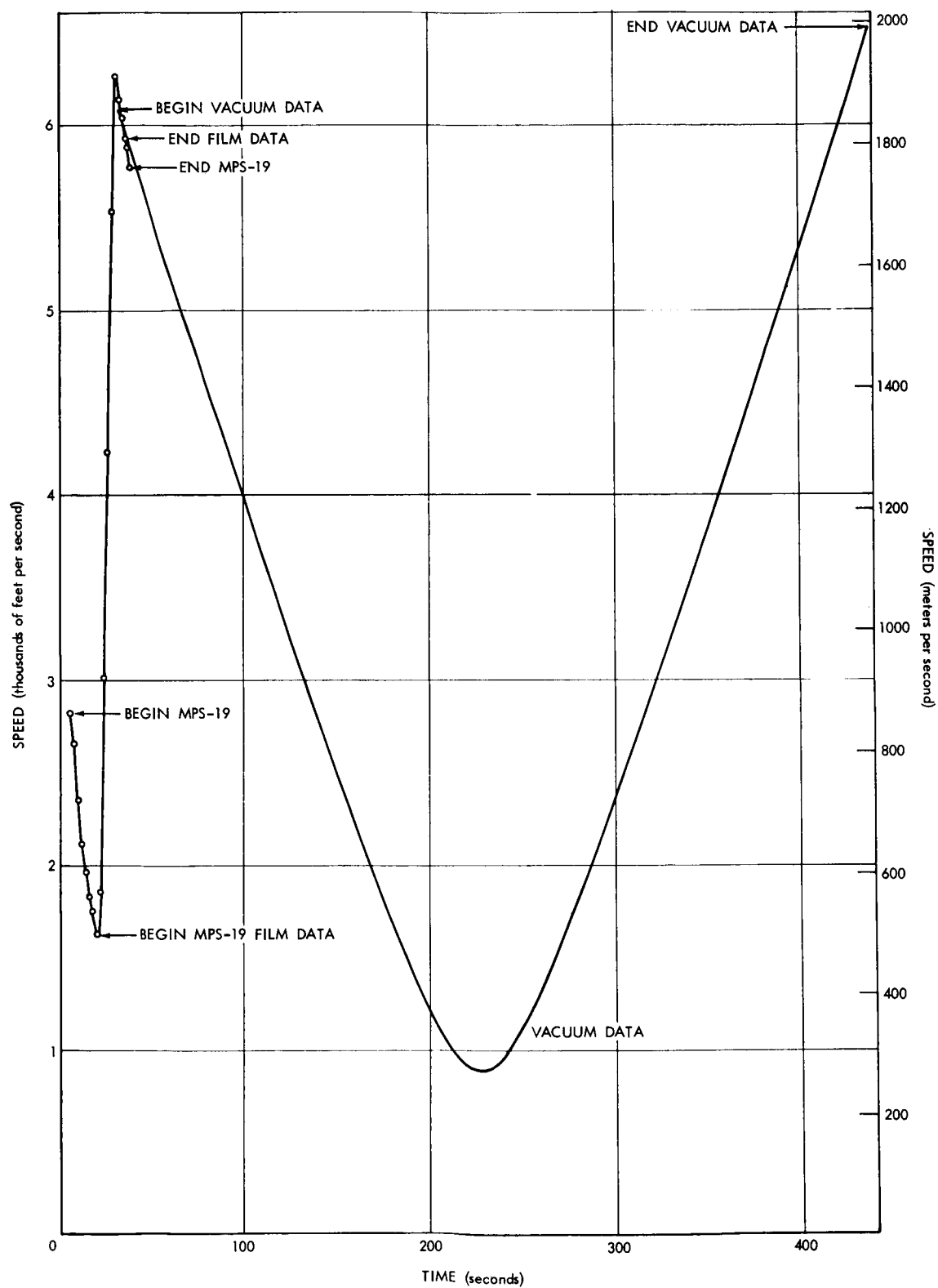


Figure 123. 14.98 UA Radar Plot, Speed vs Time

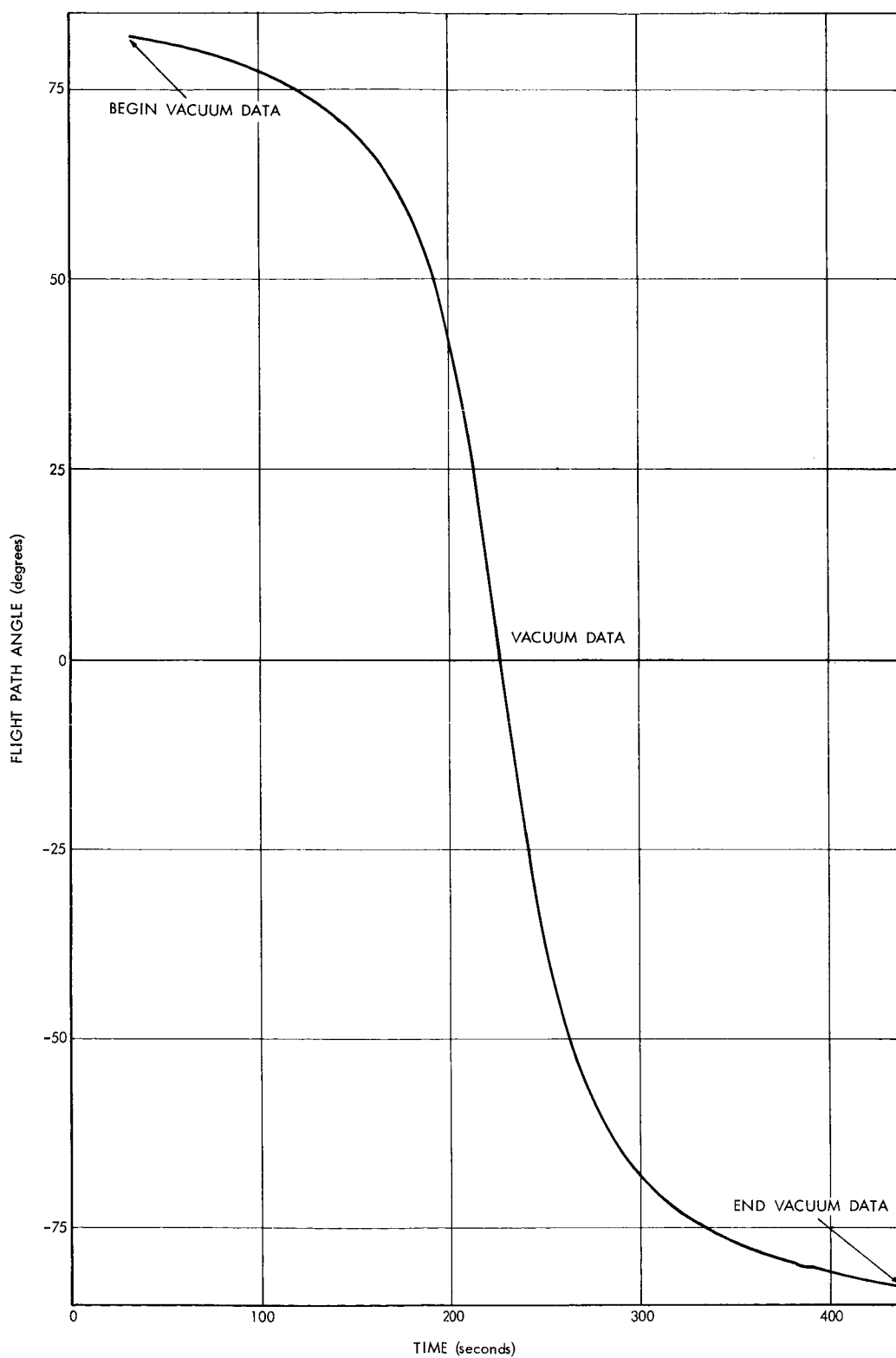


Figure 124. 14.98 UA Radar Plot, Flight Path Angle vs Time

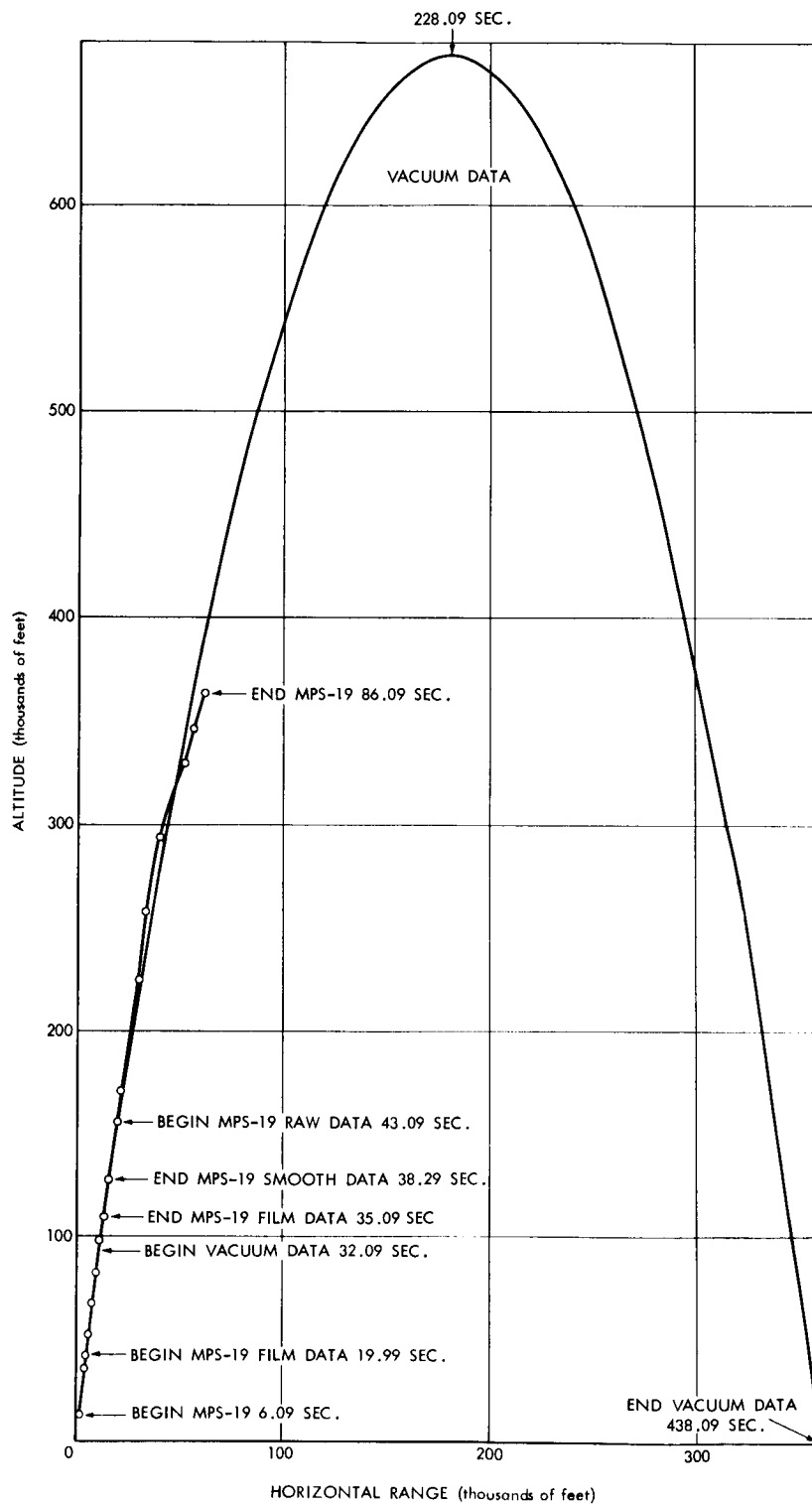


Figure 125. 14.98 UA Radar Plot, Altitude vs Horizontal Range



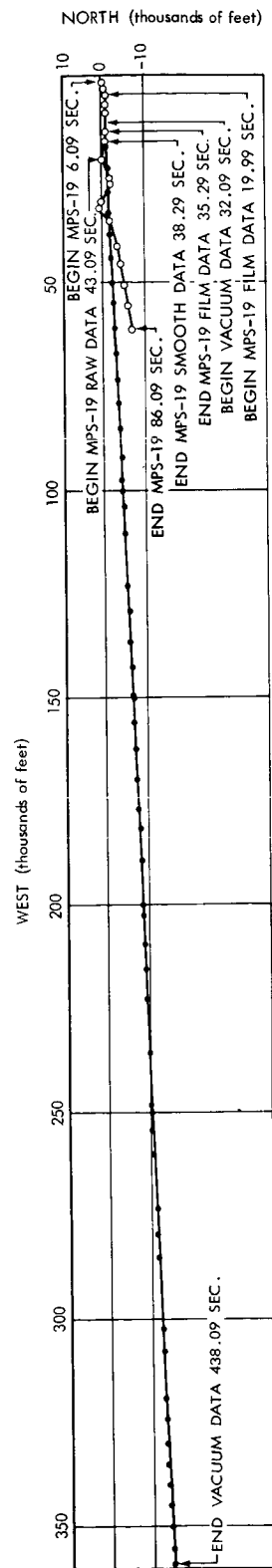


Figure 126. 14.98 UA Radar Plot, North Range vs West Range

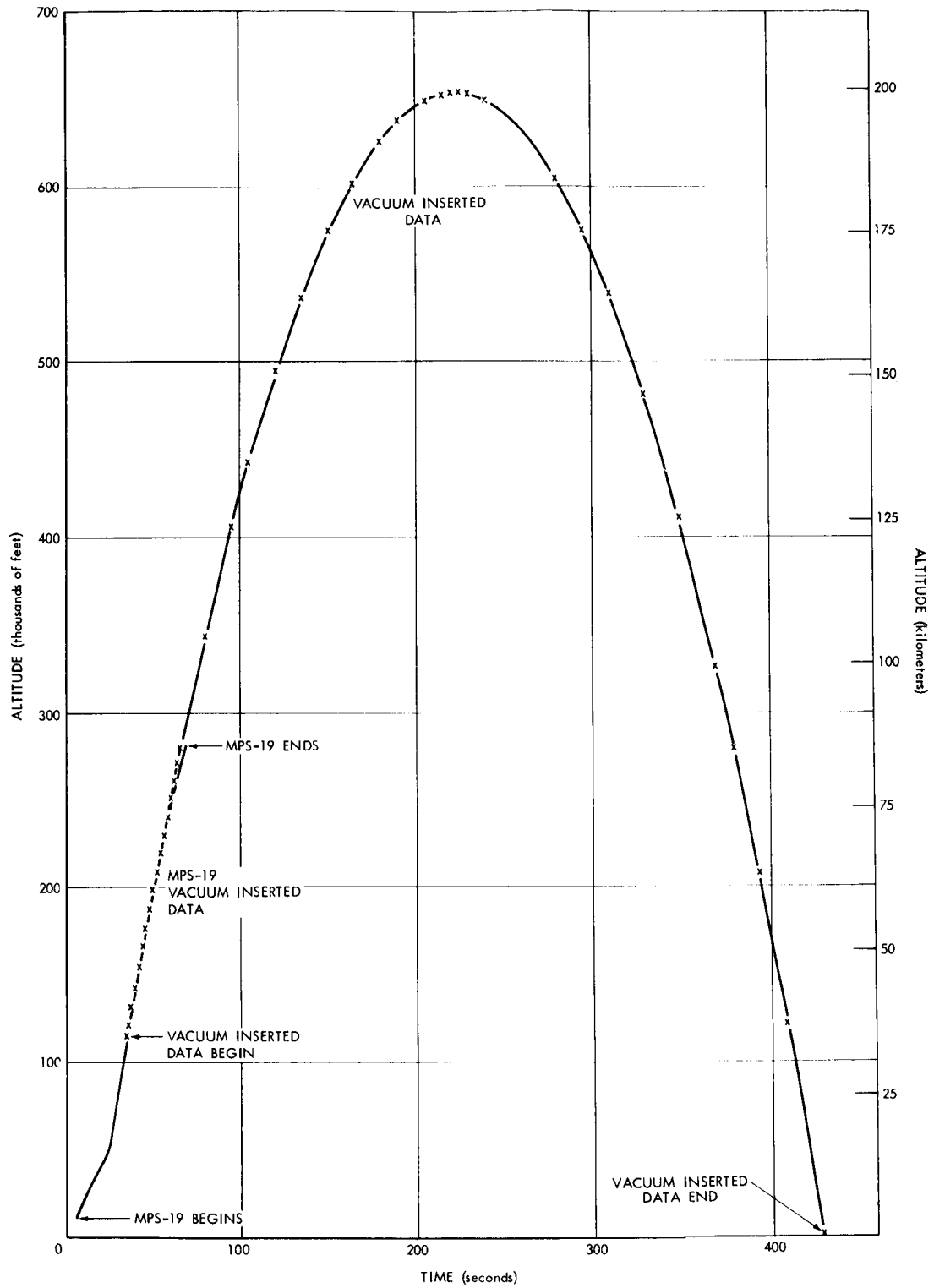


Figure 127. 14.99 UA Radar Plot, Altitude vs Time

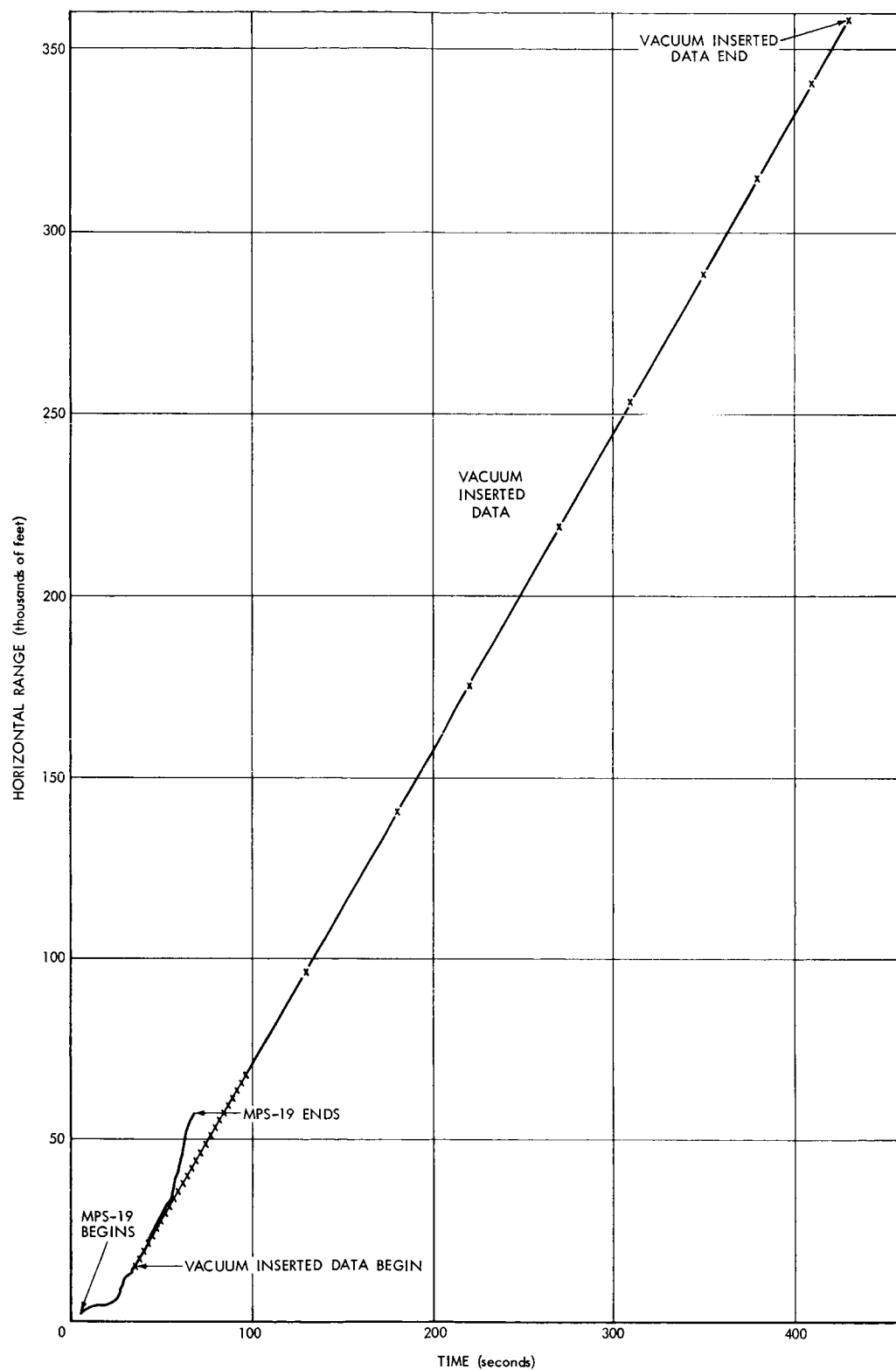


Figure 128. 14.99 UA Radar Plot, Horizontal Range vs Time

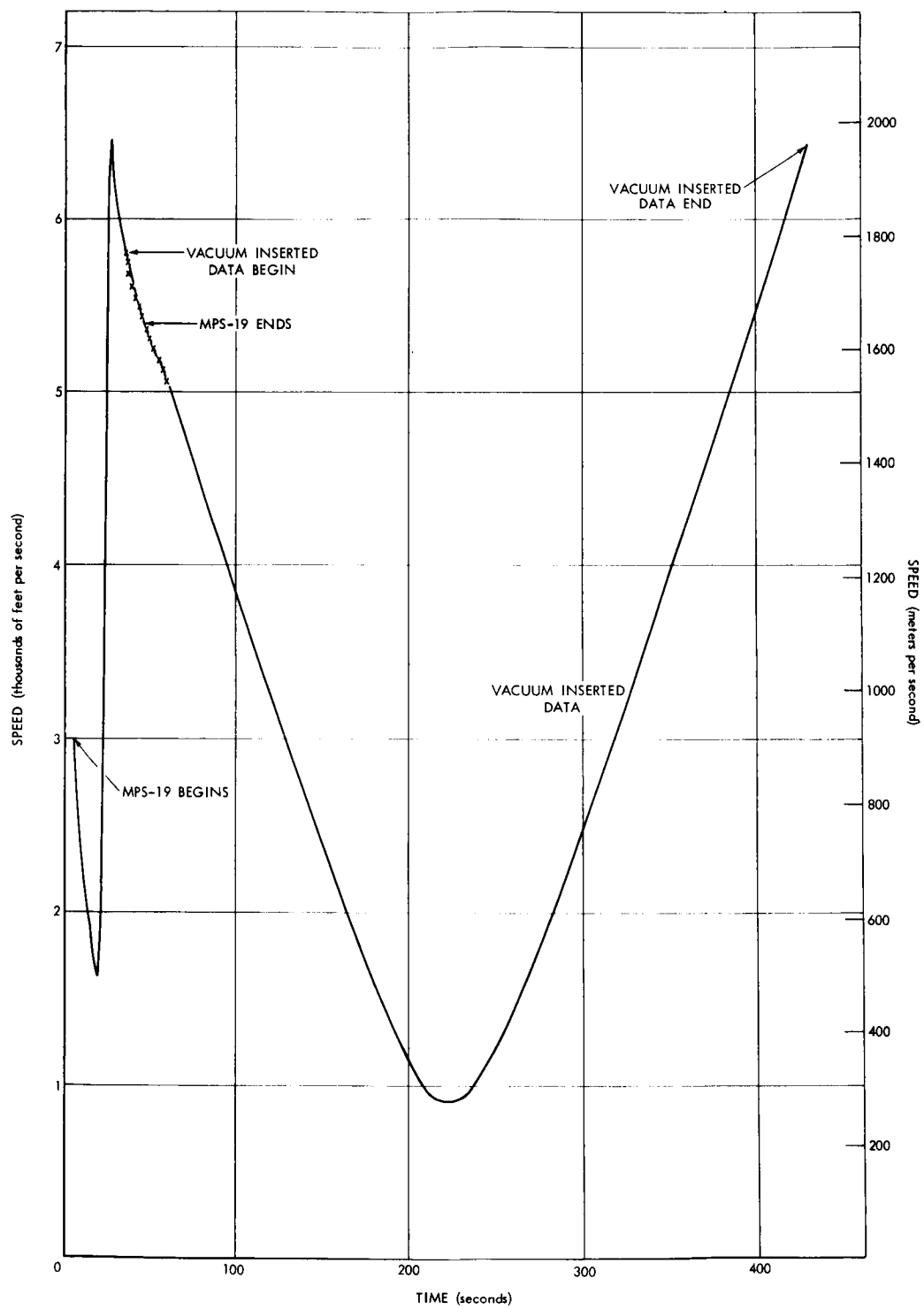


Figure 129. 14.99 UA Radar Plot, Speed vs Time

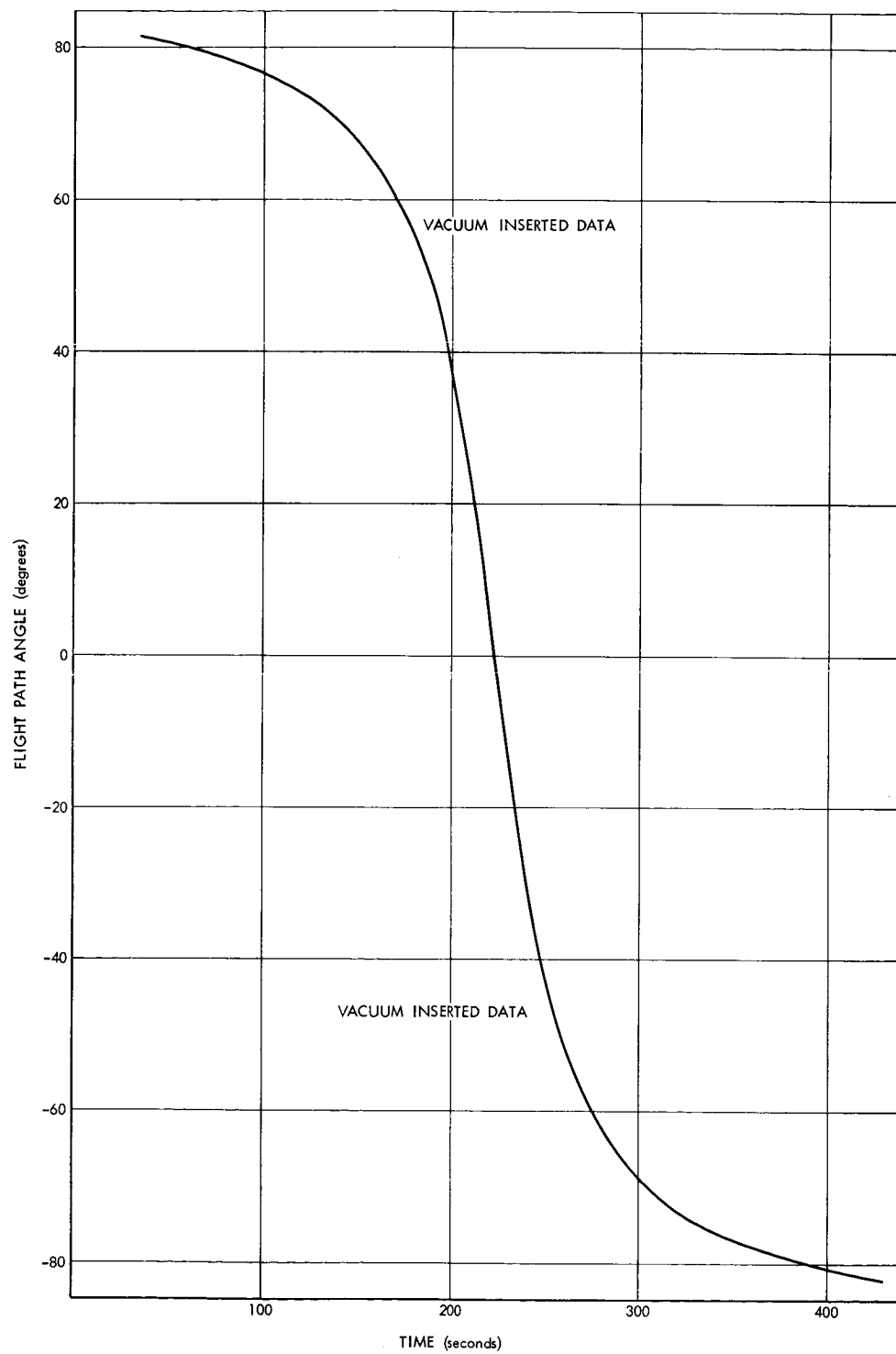


Figure 130. 14.99 UA Radar Plot, Flight Path Angle vs Time

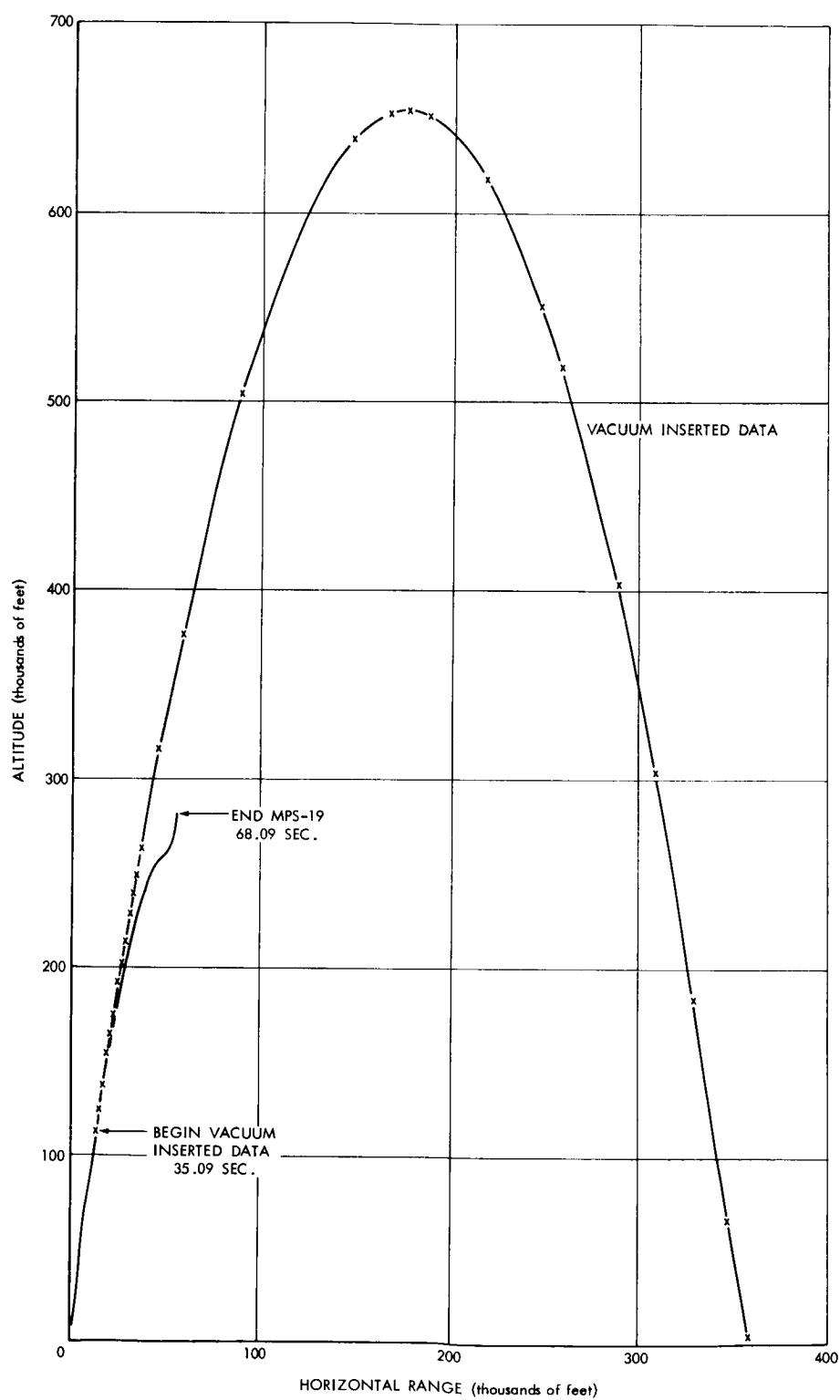


Figure 131. 14.99 UA Radar Plot, Altitude vs Horizontal Range

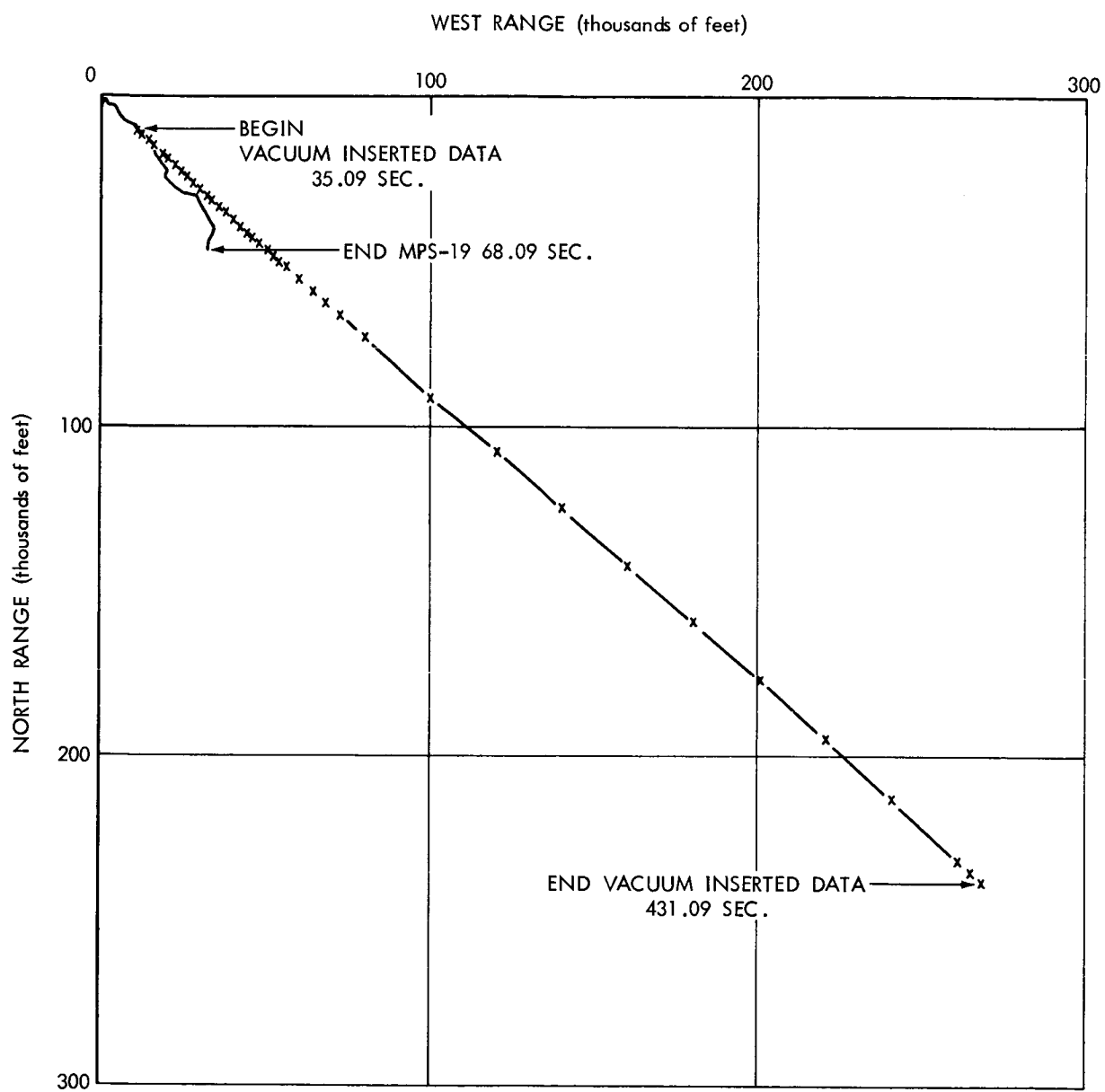


Figure 132. 14.99 UA Radar Plot, North Range vs West Range

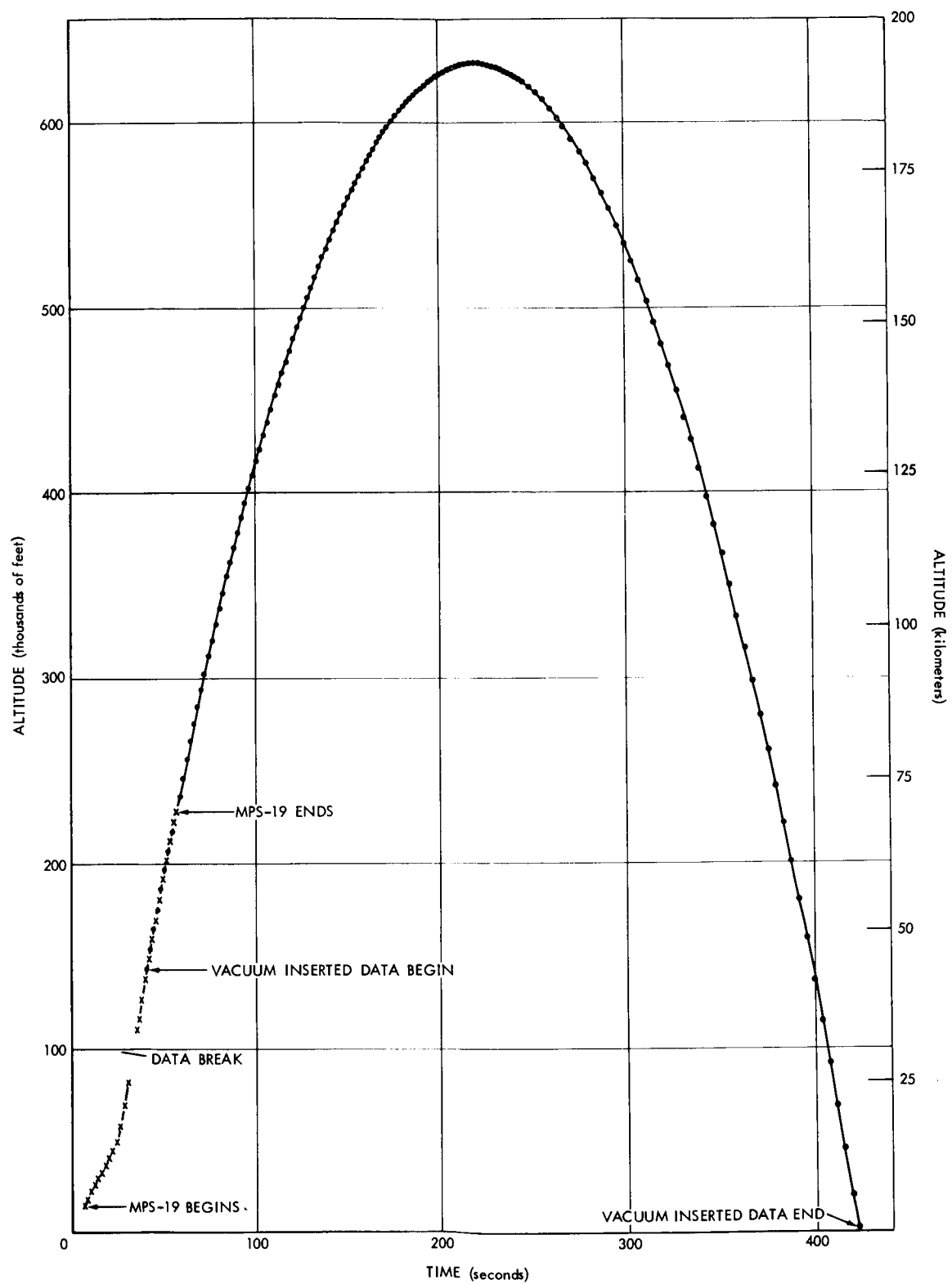


Figure 133. 14.100 UA Radar Plot, Altitude vs Time



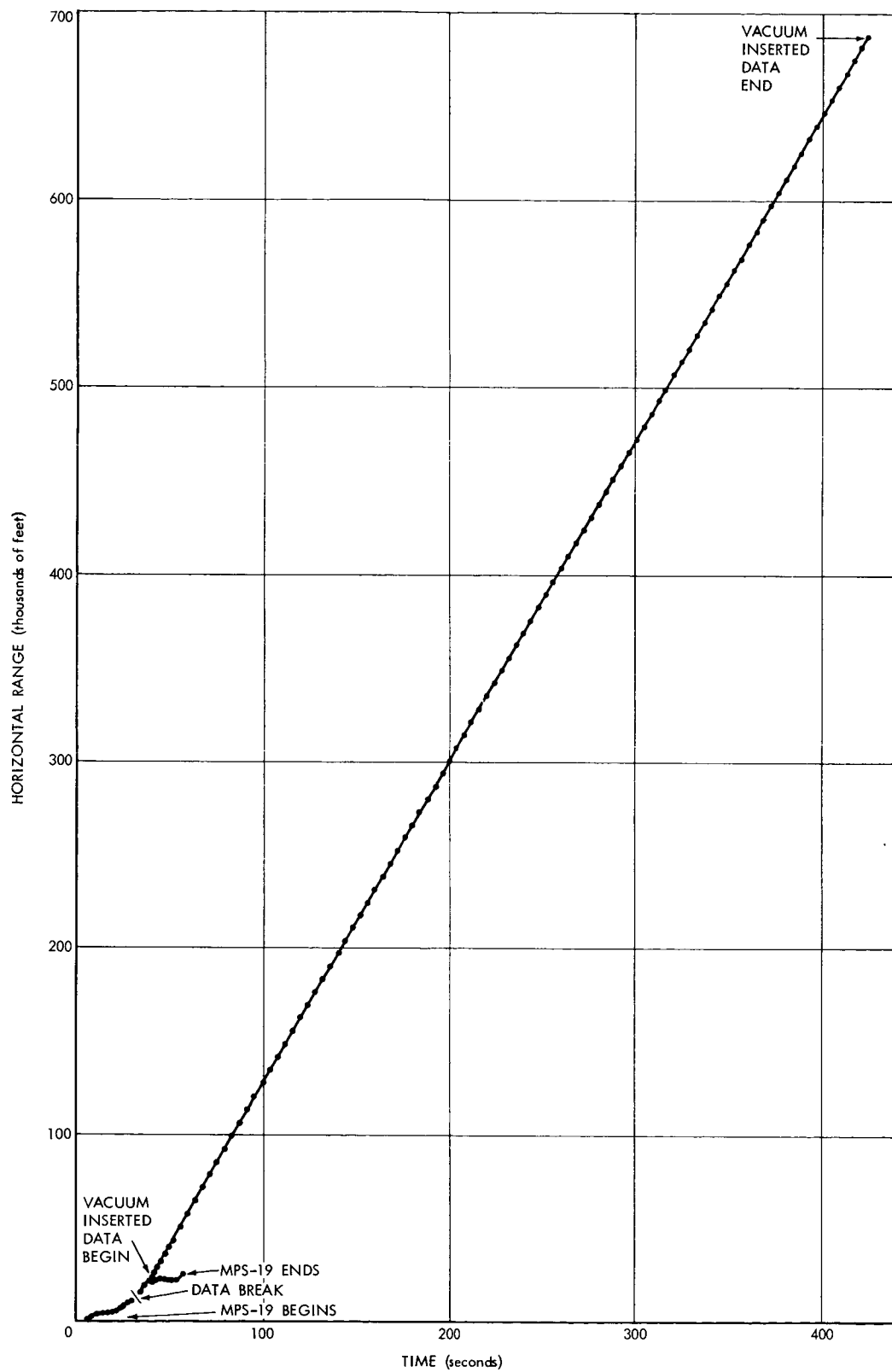


Figure 134. 14.100 UA Radar Plot, Horizontal Range vs Time

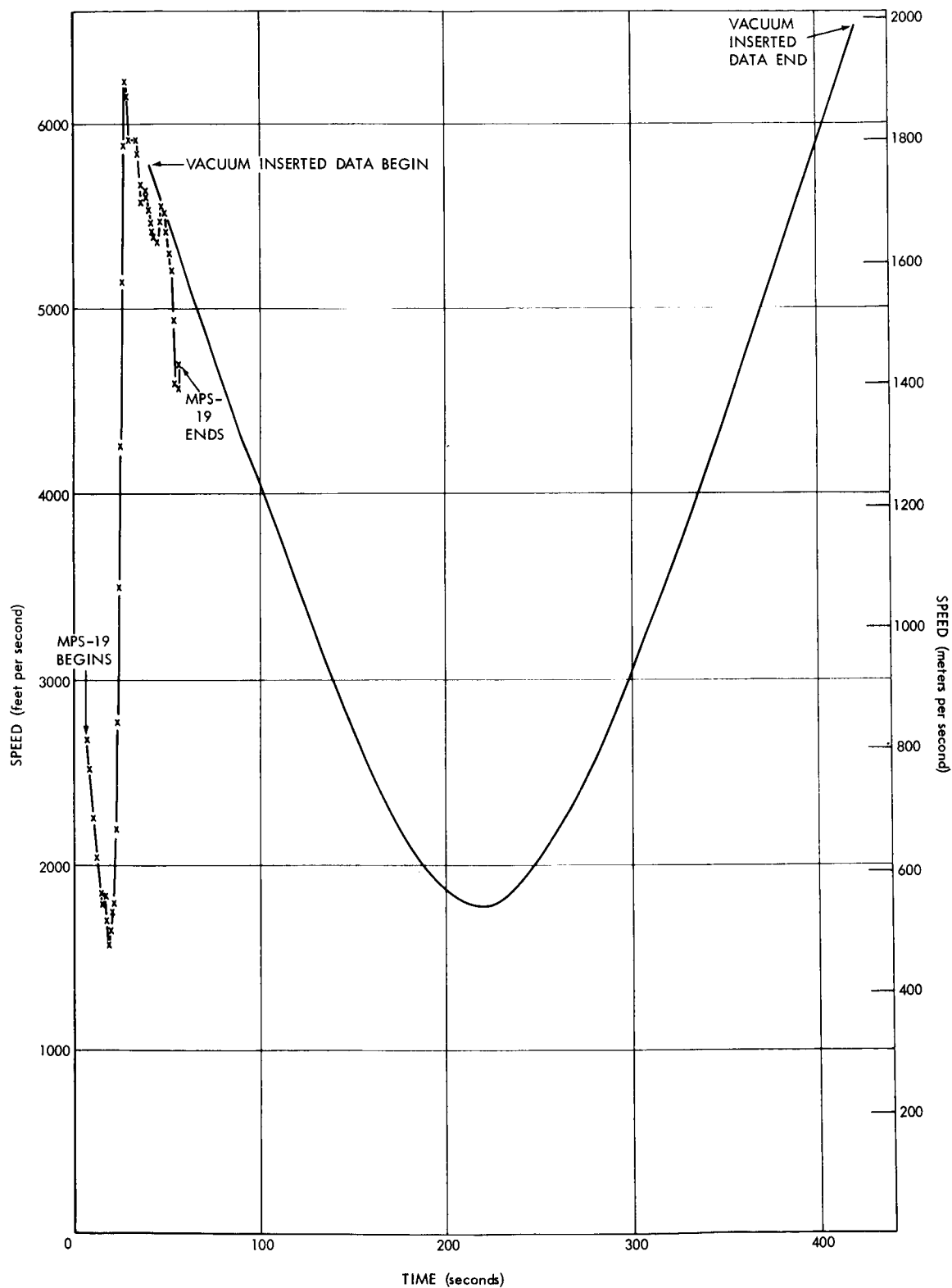


Figure 135. 14.100 UA Radar Plot, Speed vs Time

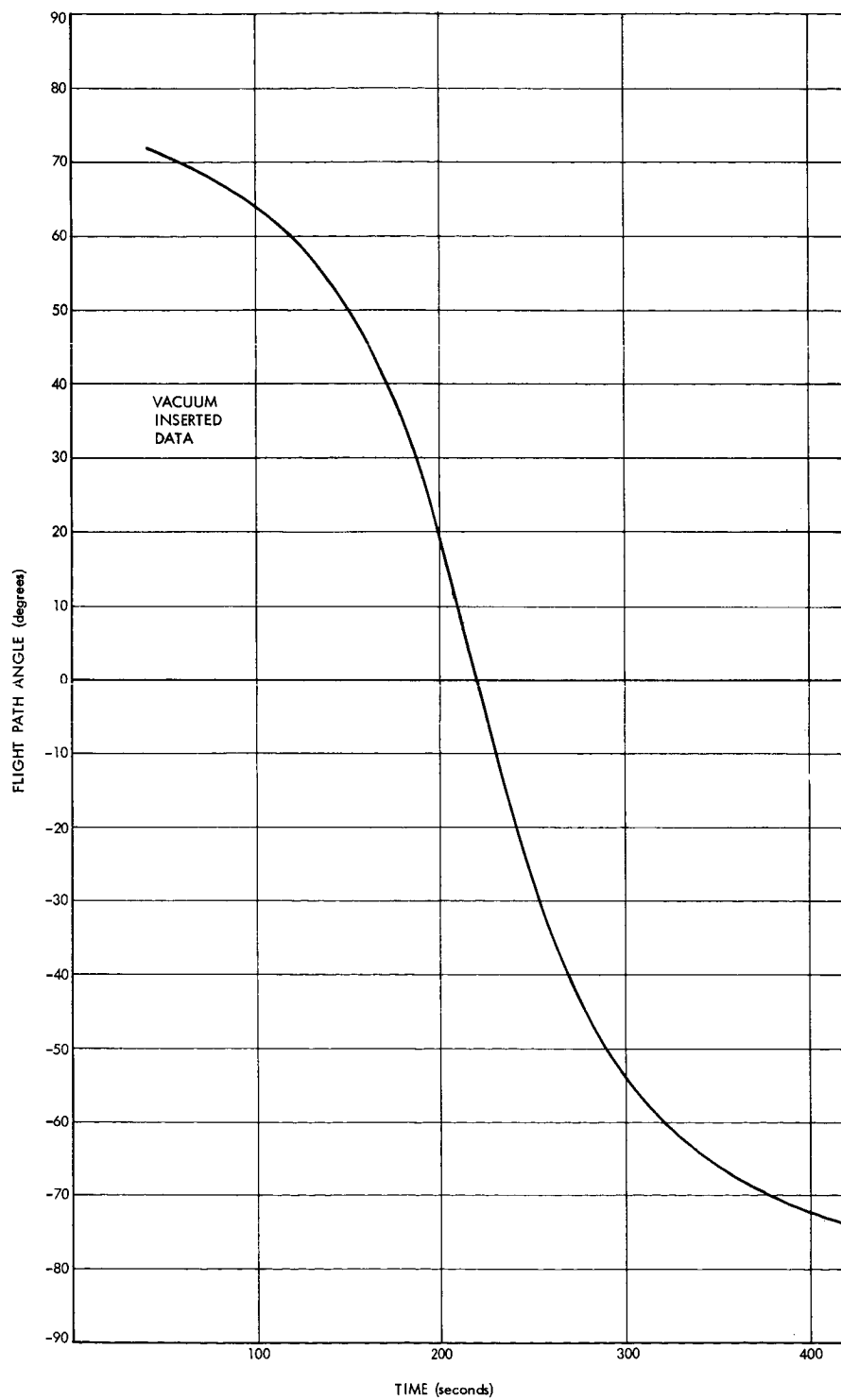


Figure 136. 14.100 UA Radar Plot, Flight Path Angle vs Time

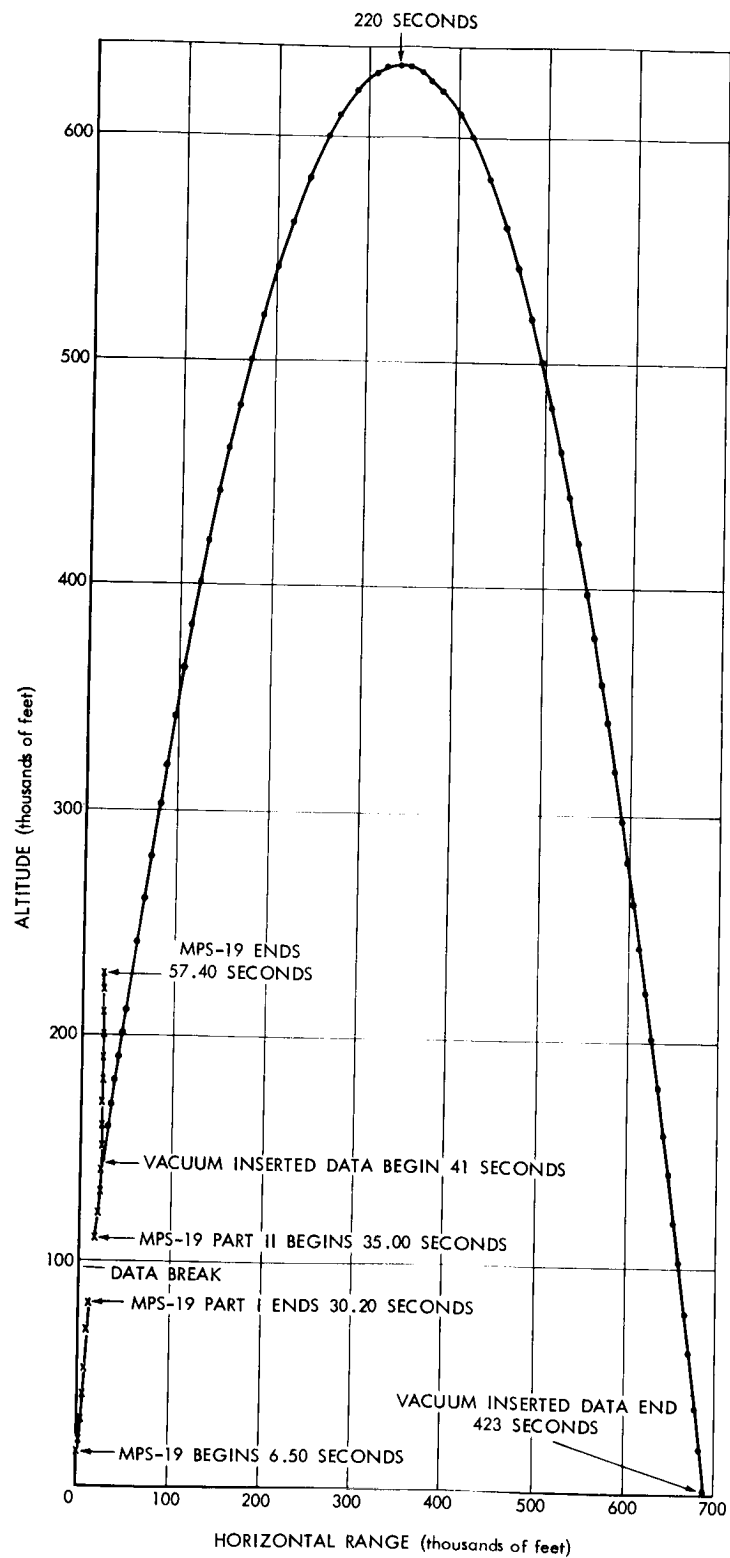


Figure 137. 14.100 UA Radar Plot, Altitude vs Horizontal Range

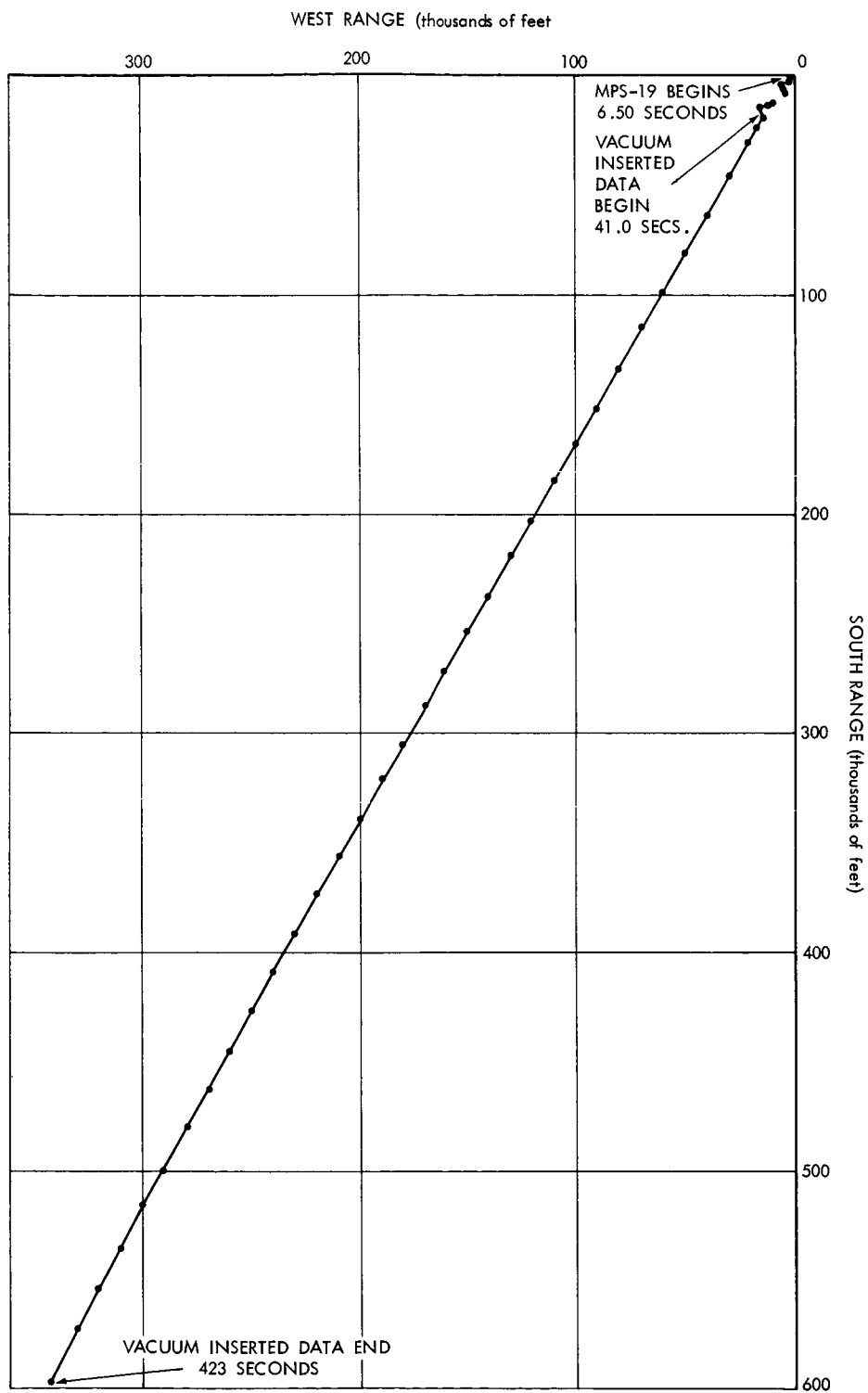


Figure 138. 14.100 UA Radar Plot, South Range vs West Range

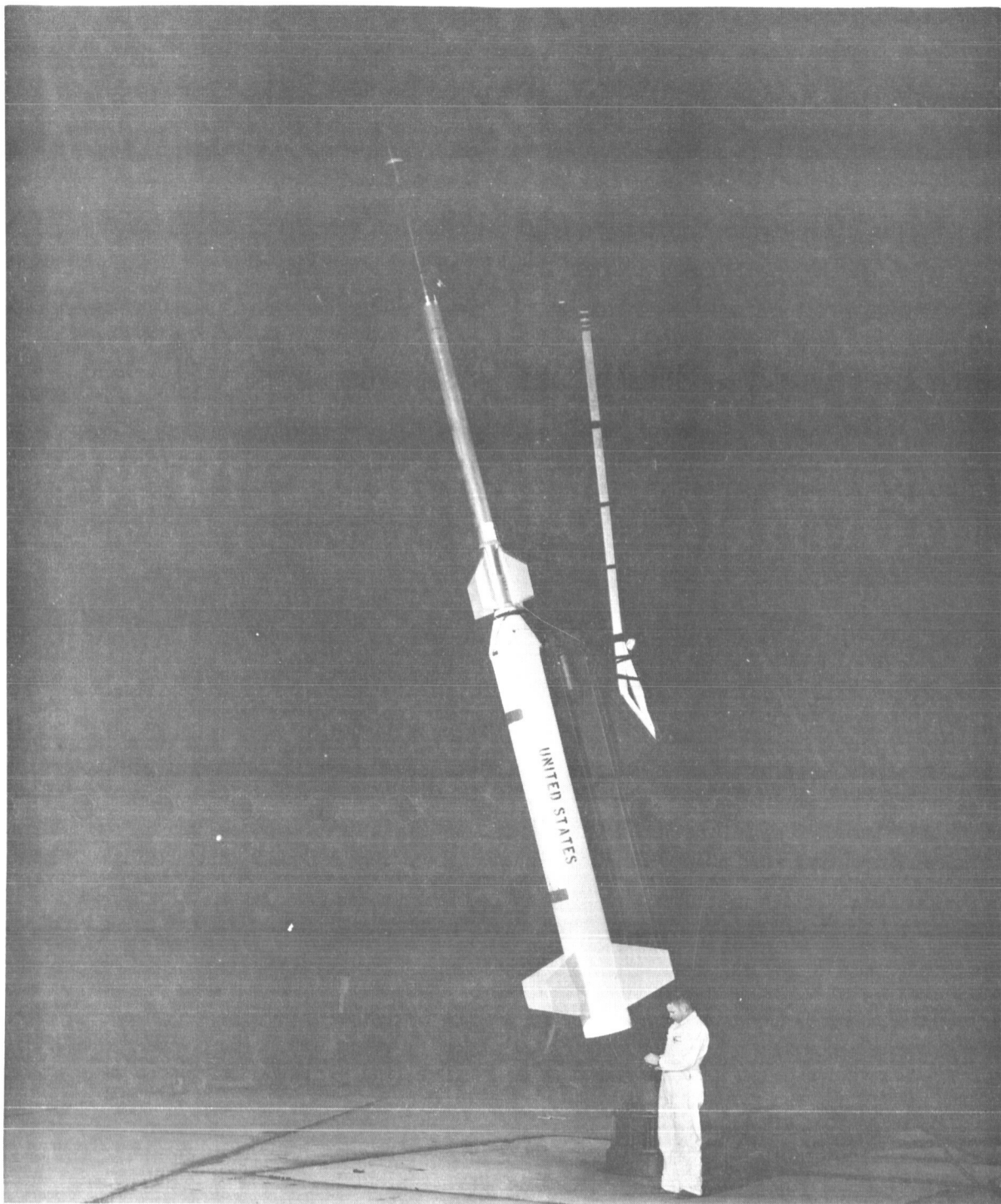


Figure 139. 14.132 NA Photograph

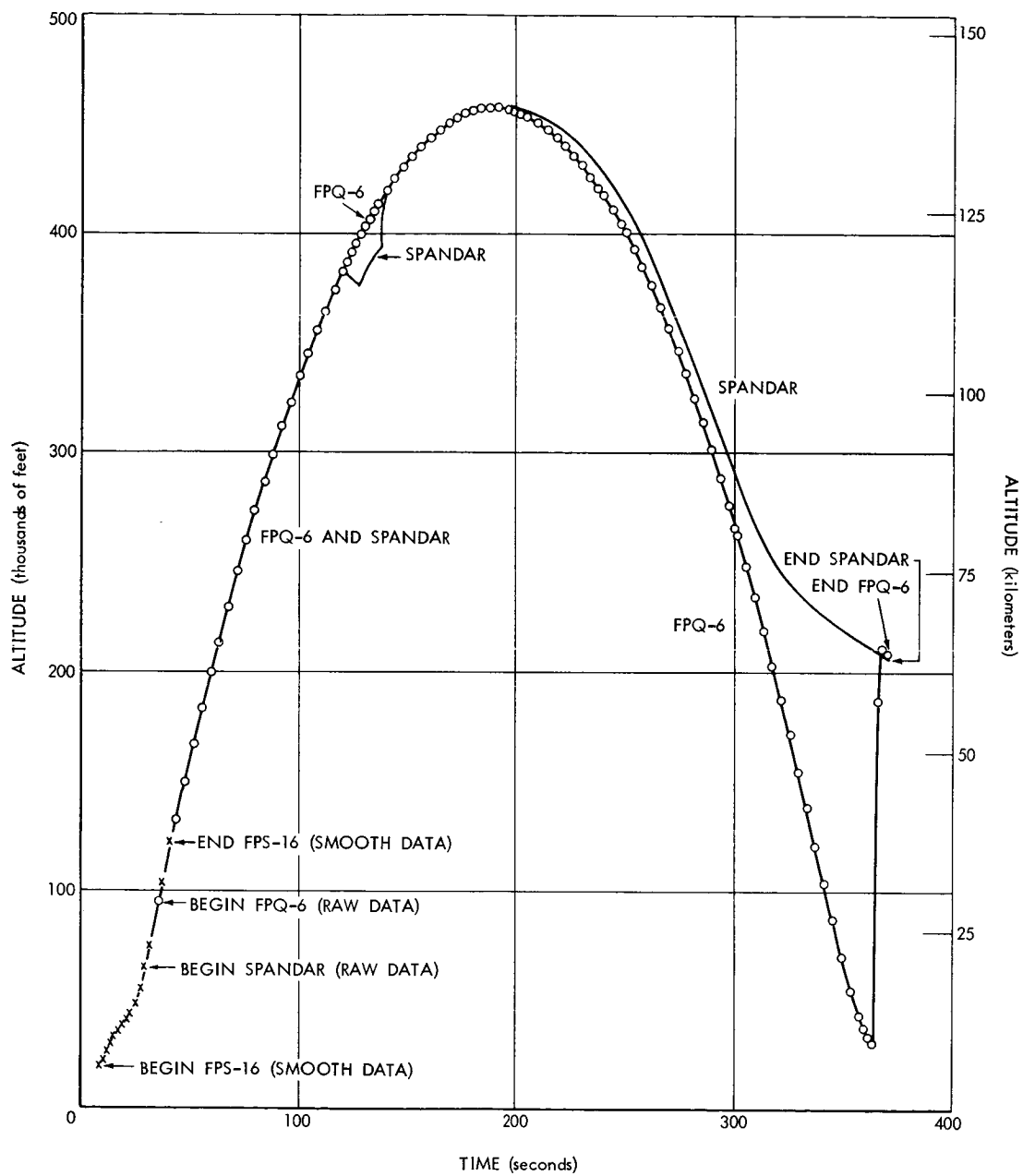


Figure 140. 14.132 NA Radar Plot, Altitude vs Time

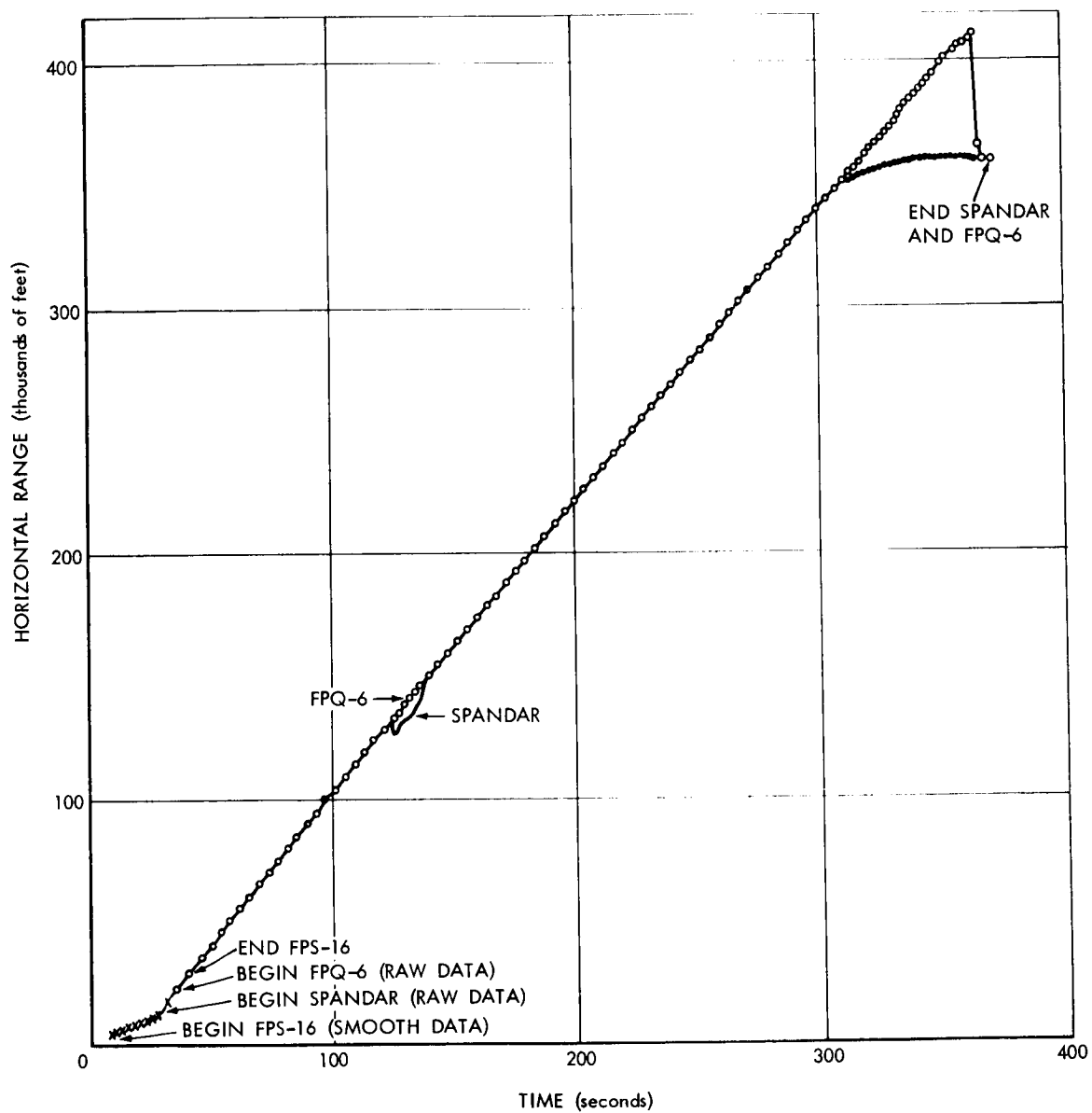


Figure 141. 14.132 NA Radar Plot, Horizontal Range vs Time



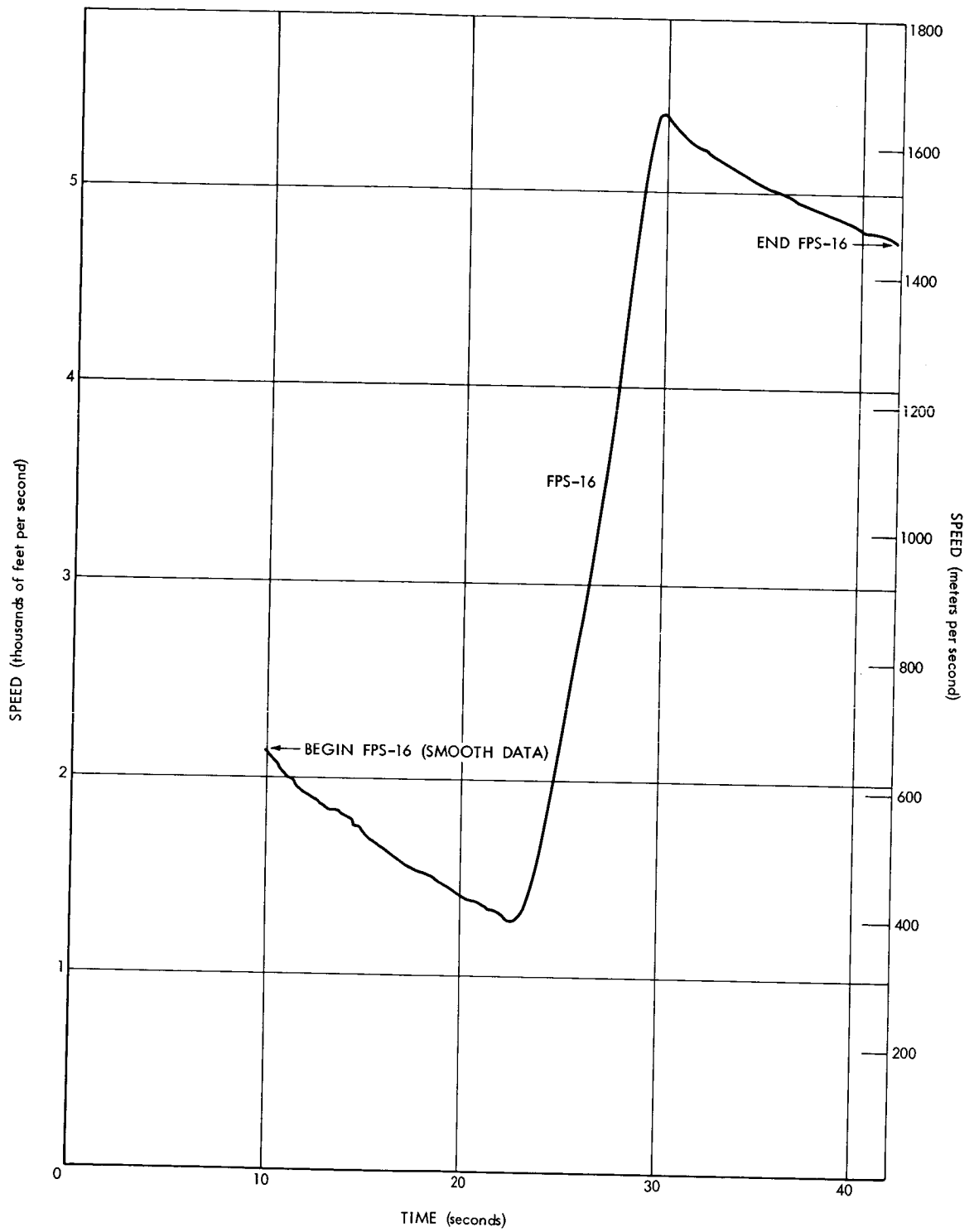


Figure 142. 14.132 NA Radar Plot, Speed vs Time

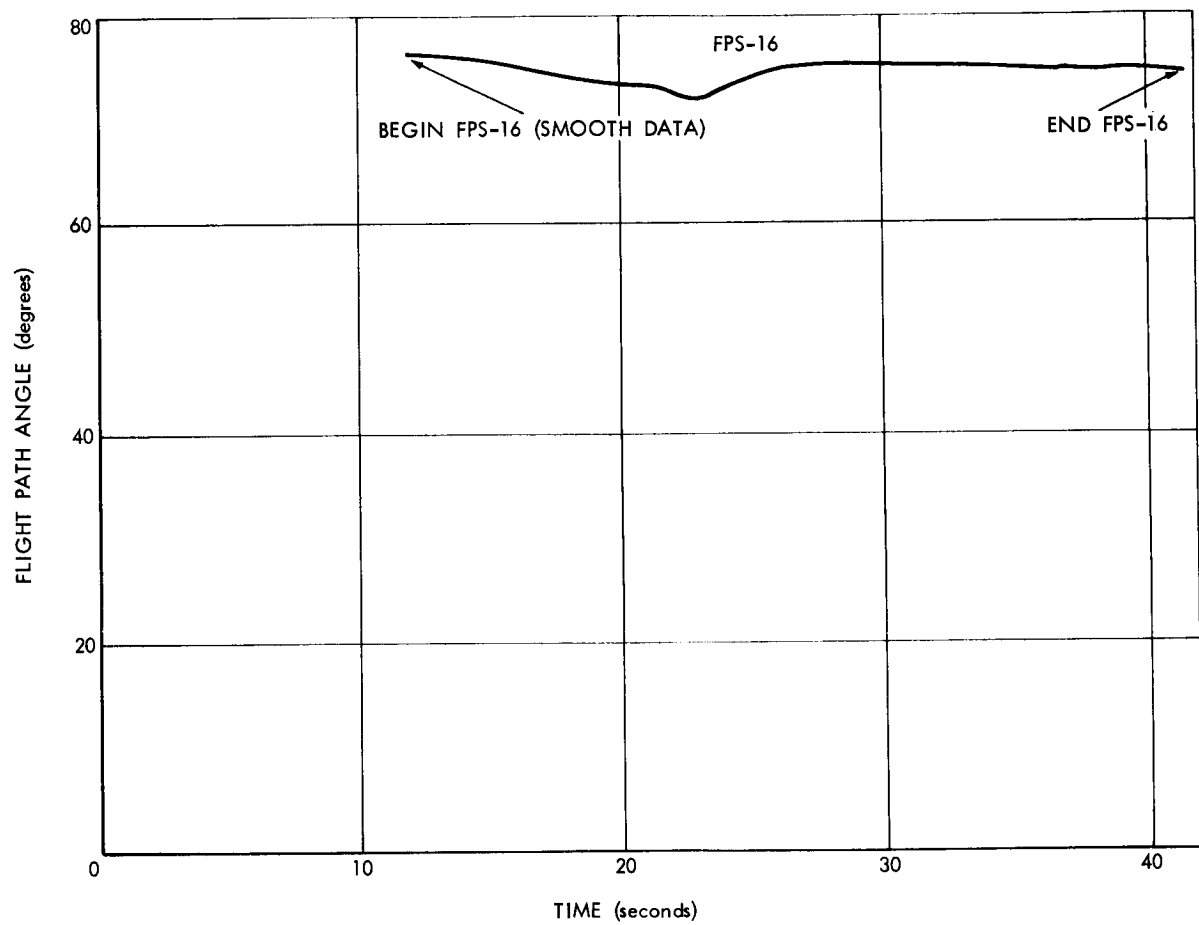


Figure 143. 14.132 NA Radar Plot, Flight Path Angle vs Time

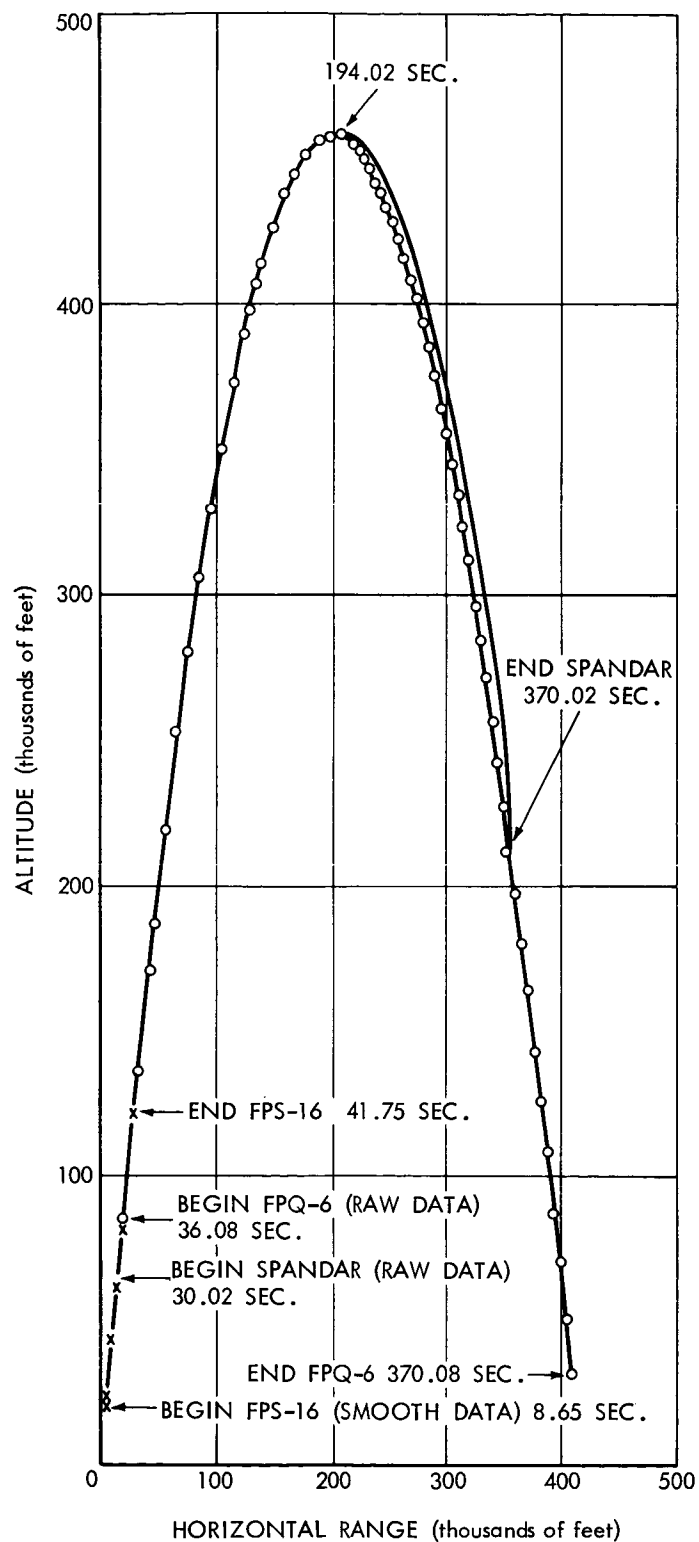


Figure 144. 14.132 NA Radar Plot, Altitude vs Horizontal Range

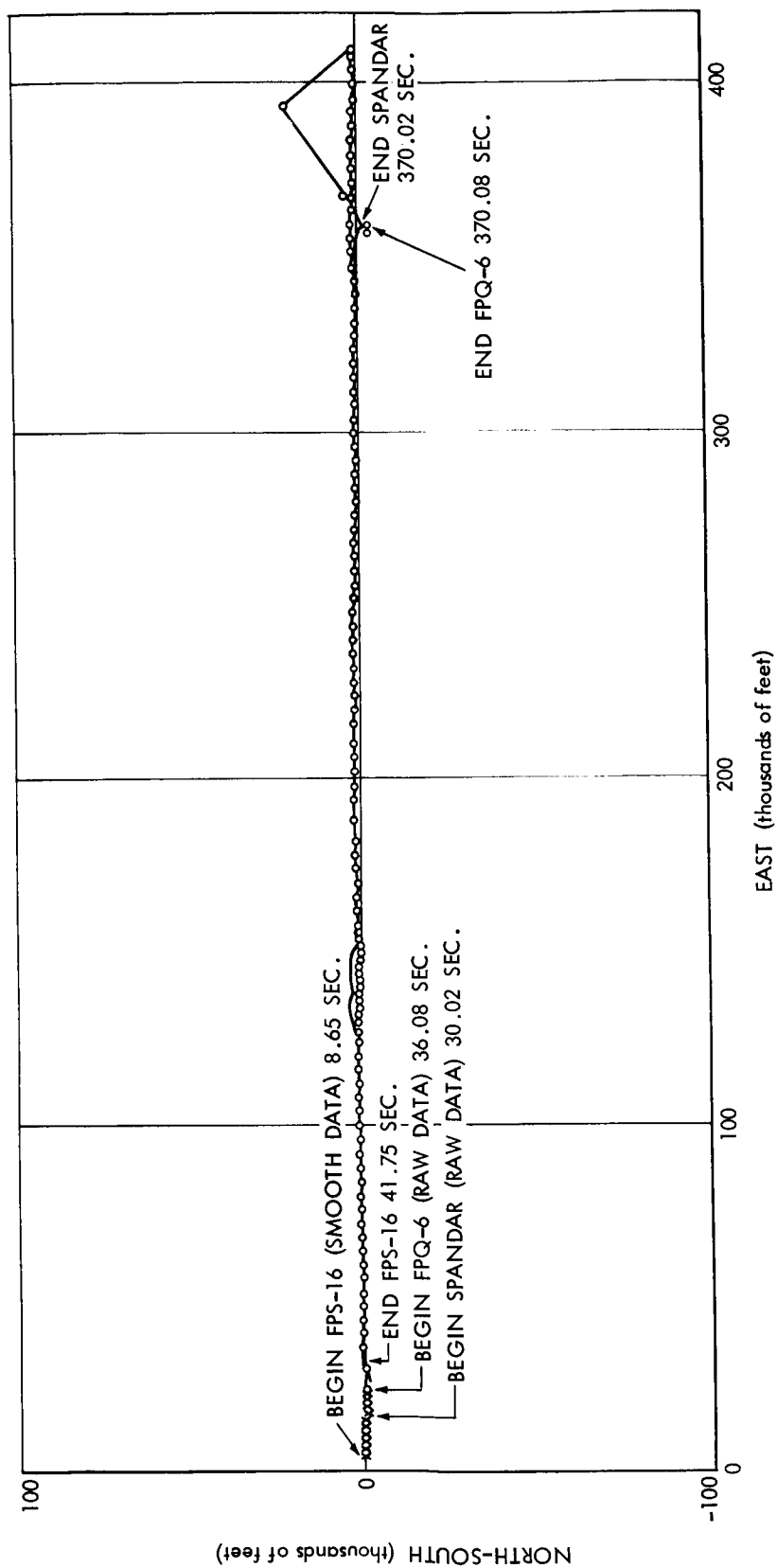


Figure 145. 14.132 NA Radar Plot, North-South Range vs East Range

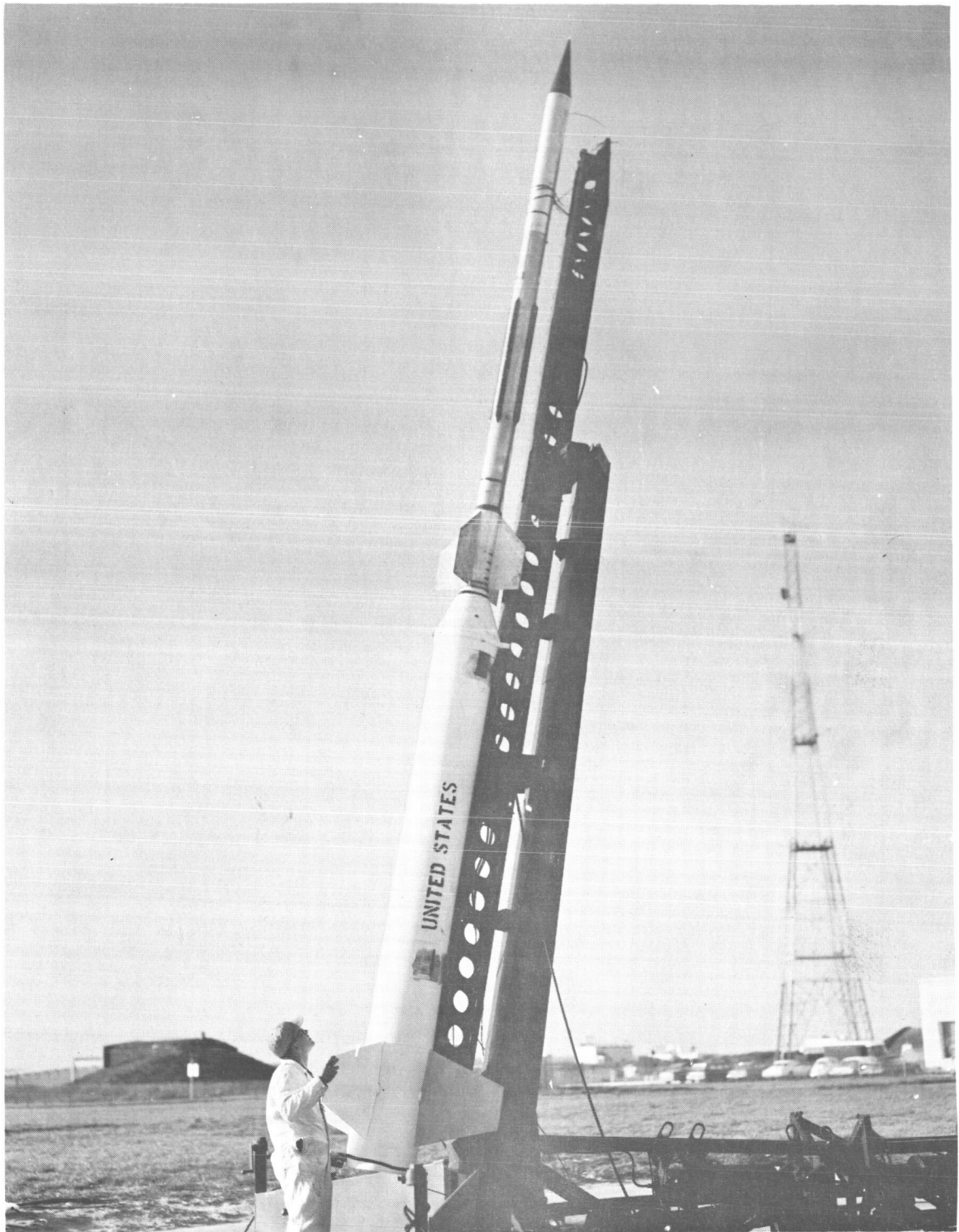


Figure 146. 14.142 NA Photograph

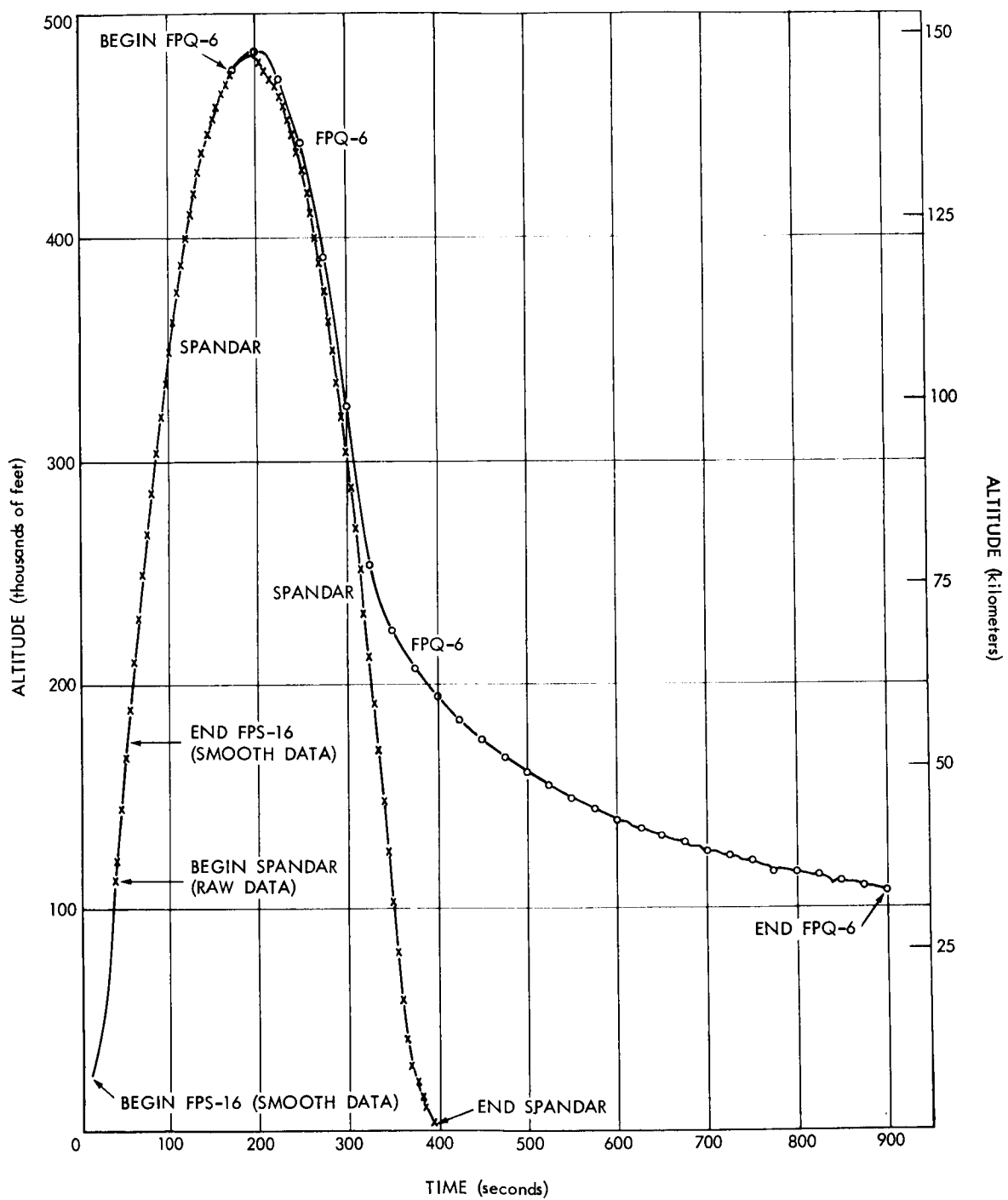


Figure 147. 14.142 NA Radar Plot, Altitude vs Time

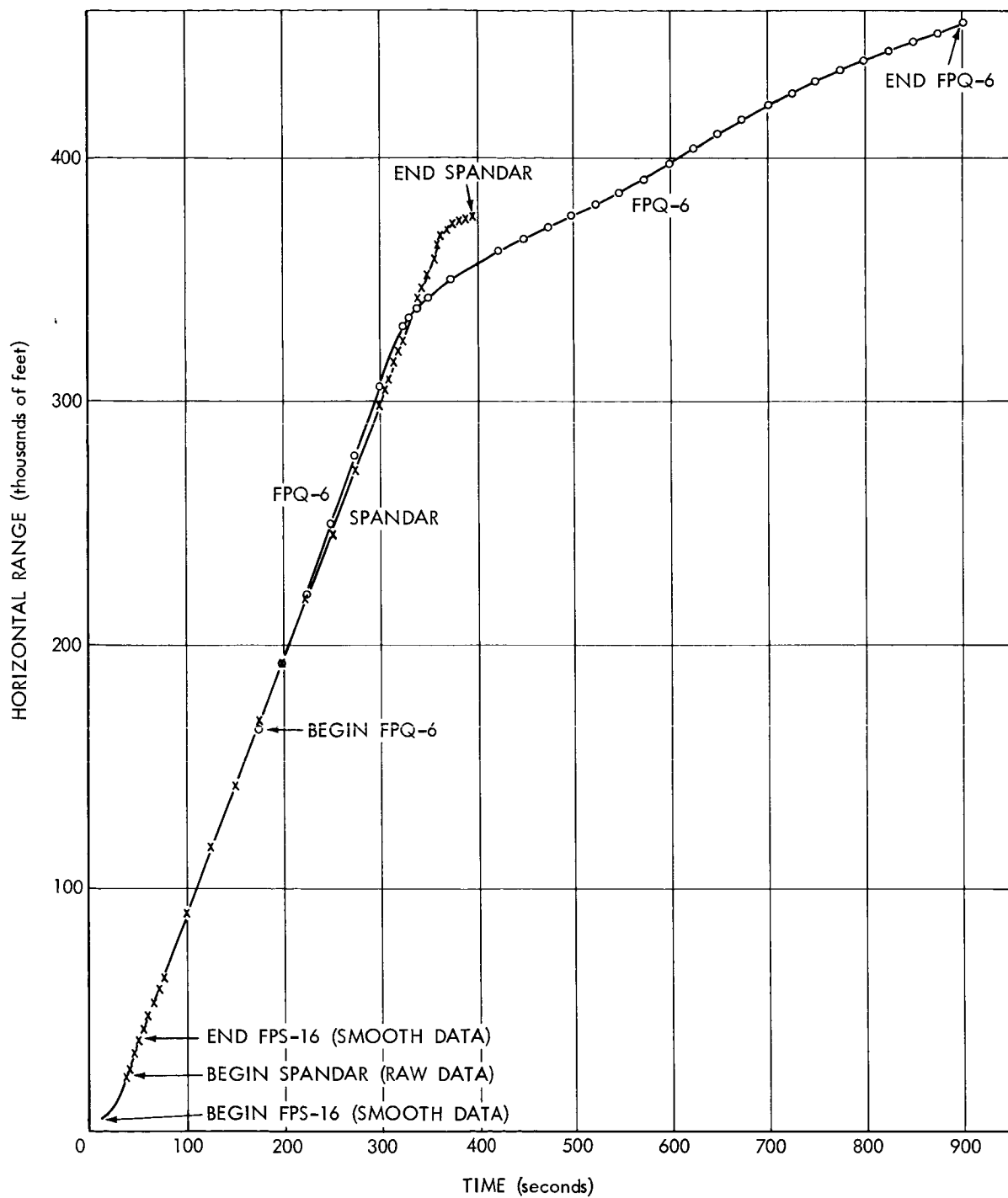


Figure 148. 14.142 NA Radar Plot, Horizontal Range vs Time

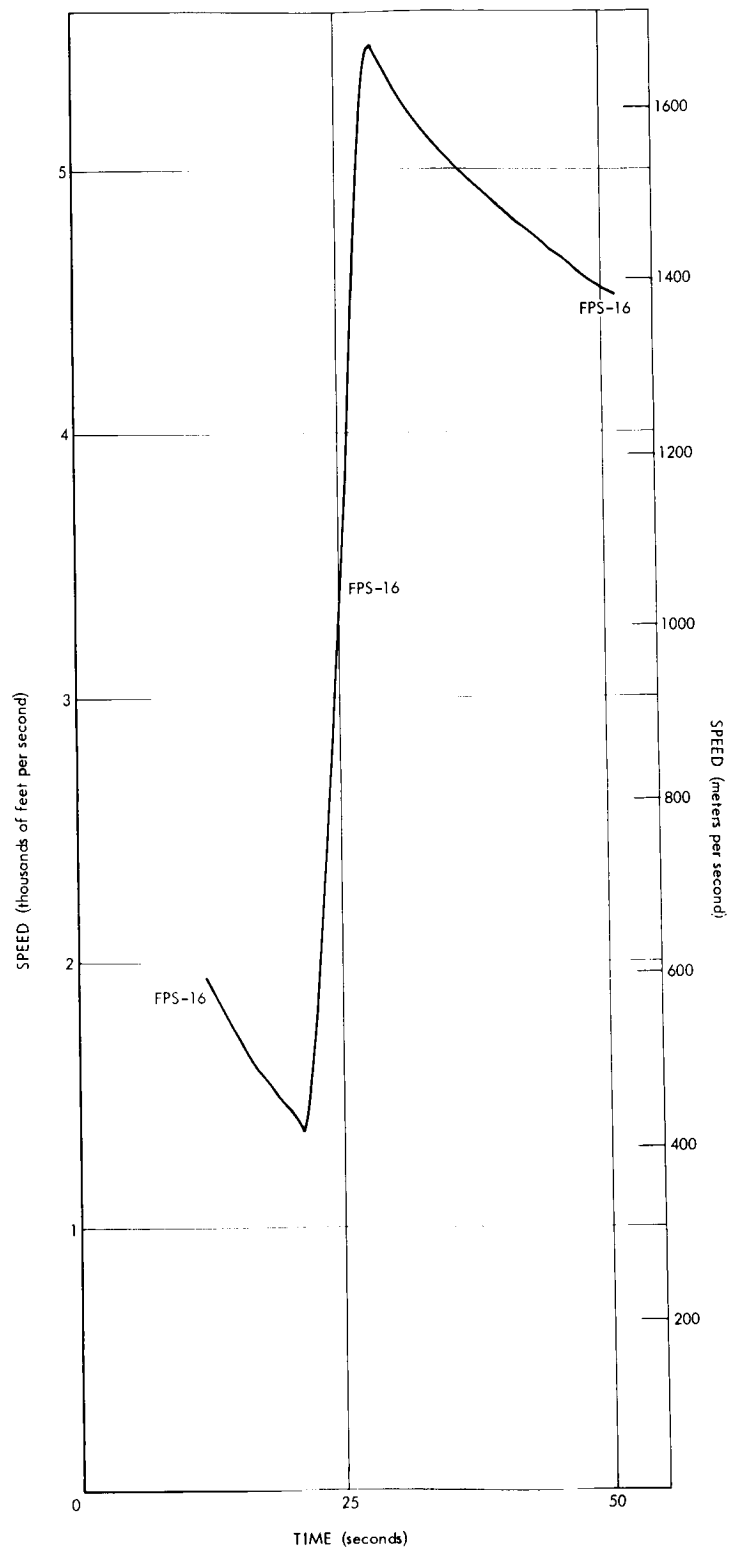


Figure 149. 14.142 NA Radar Plot, Speed vs Time



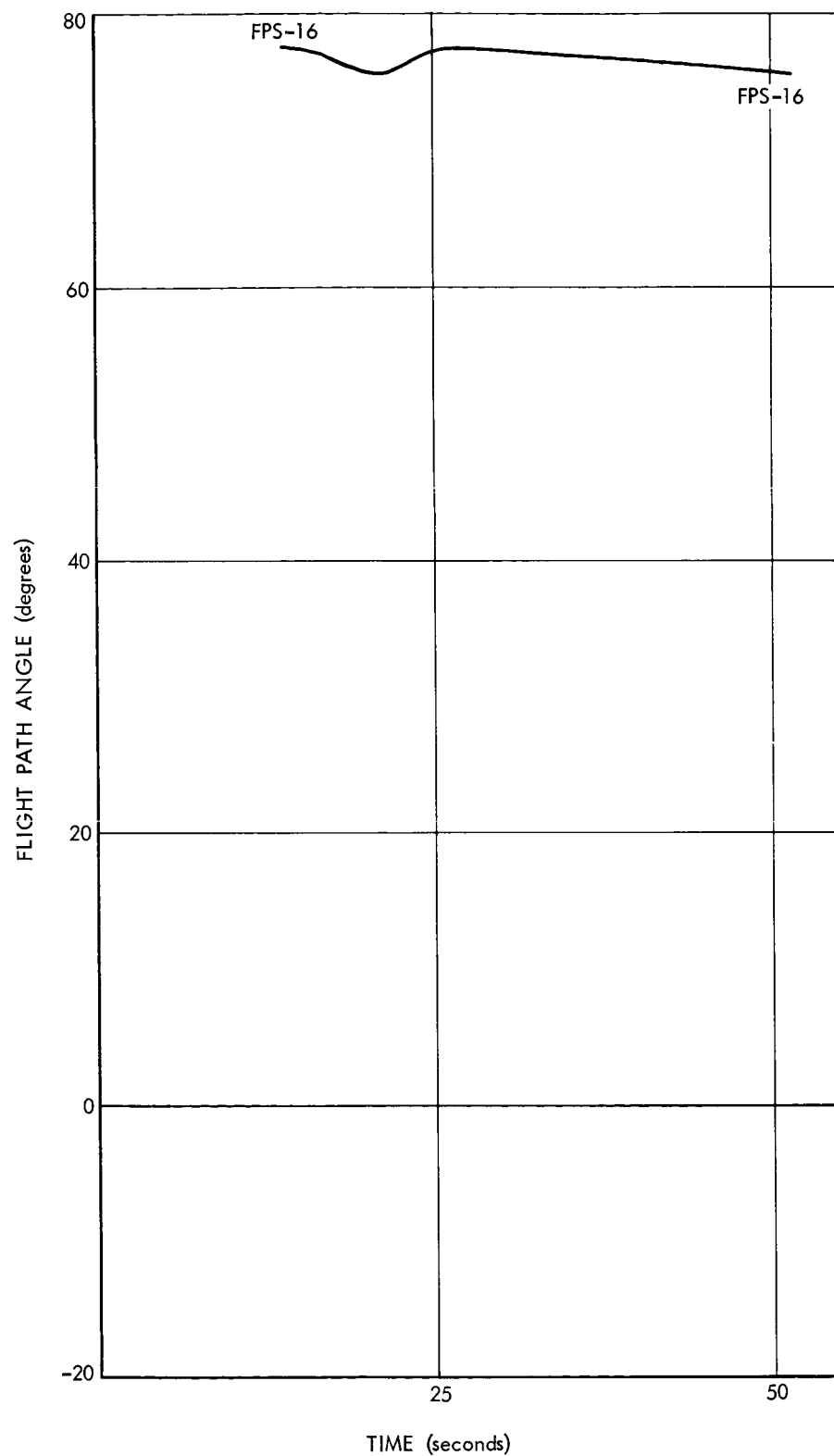


Figure 150. 14.142 NA Radar Plot, Flight Path Angle vs Time

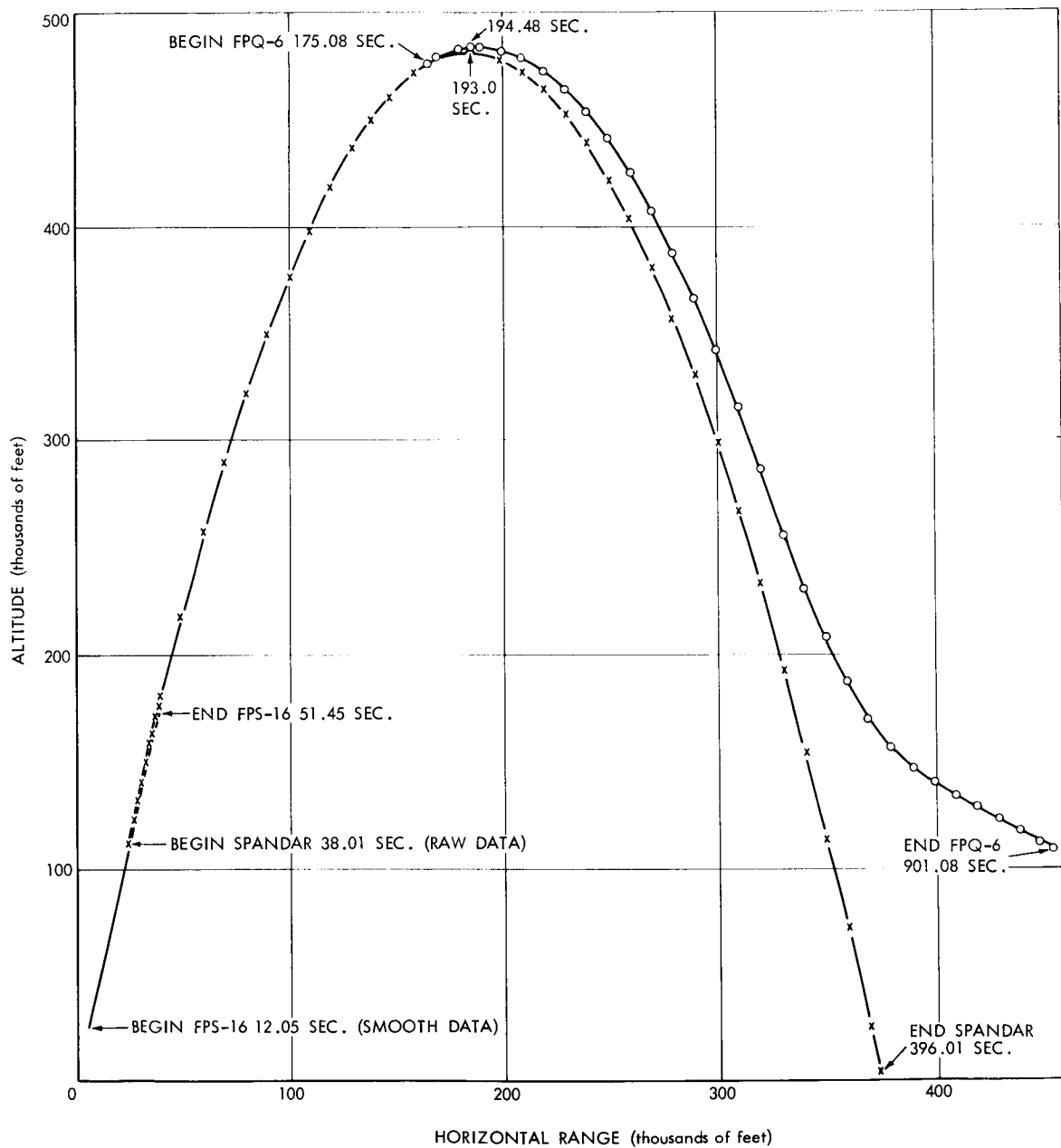


Figure 151. 14.142 NA Radar Plot, Altitude vs Horizontal Range

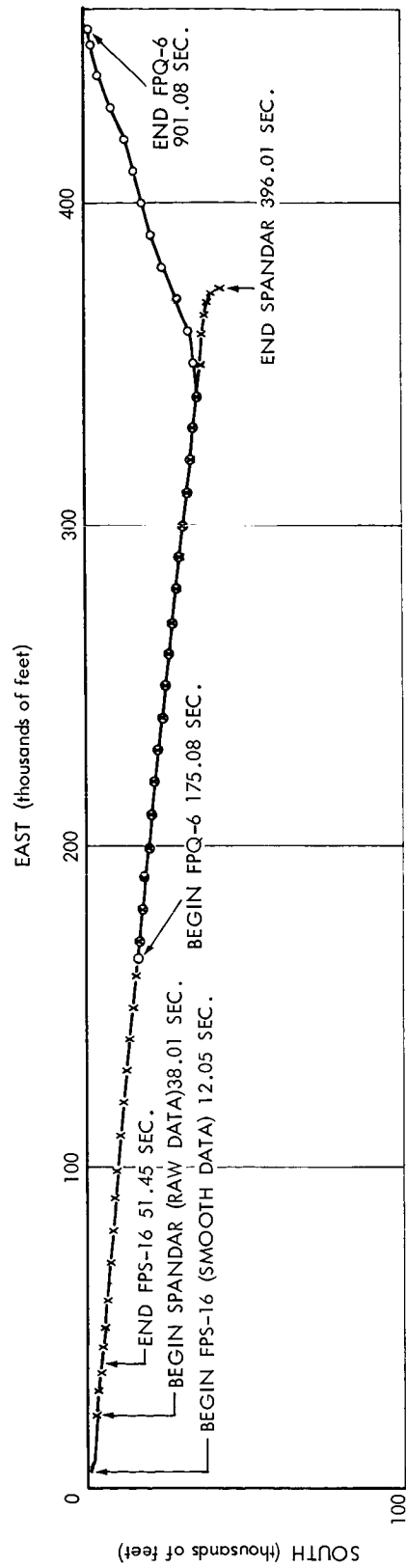


Figure 152. 14.142 NA Radar Plot, South Range vs East Range

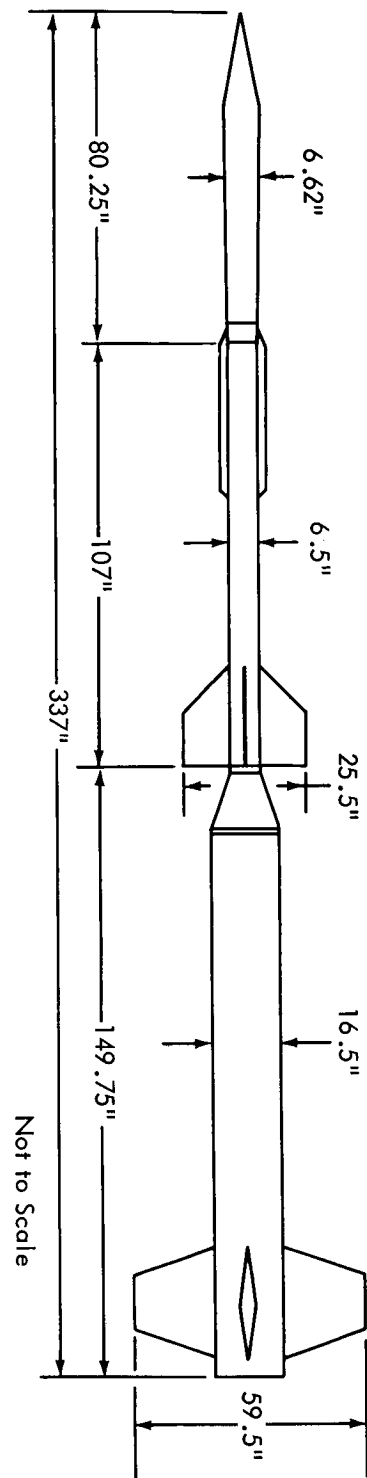


Figure 153. 14.160 GE Sketch

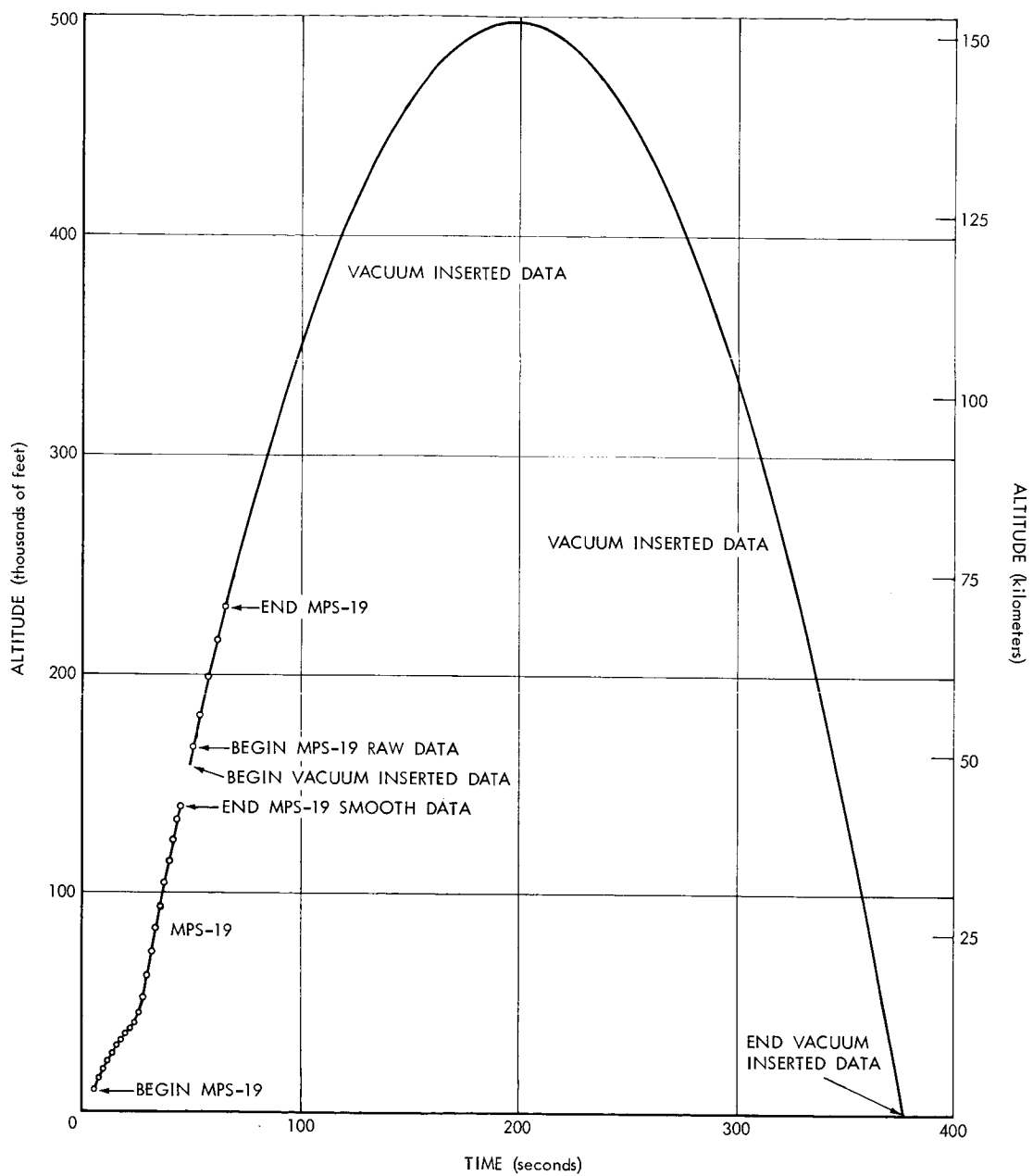


Figure 154. 14.160 GE Radar Plot, Altitude vs Time

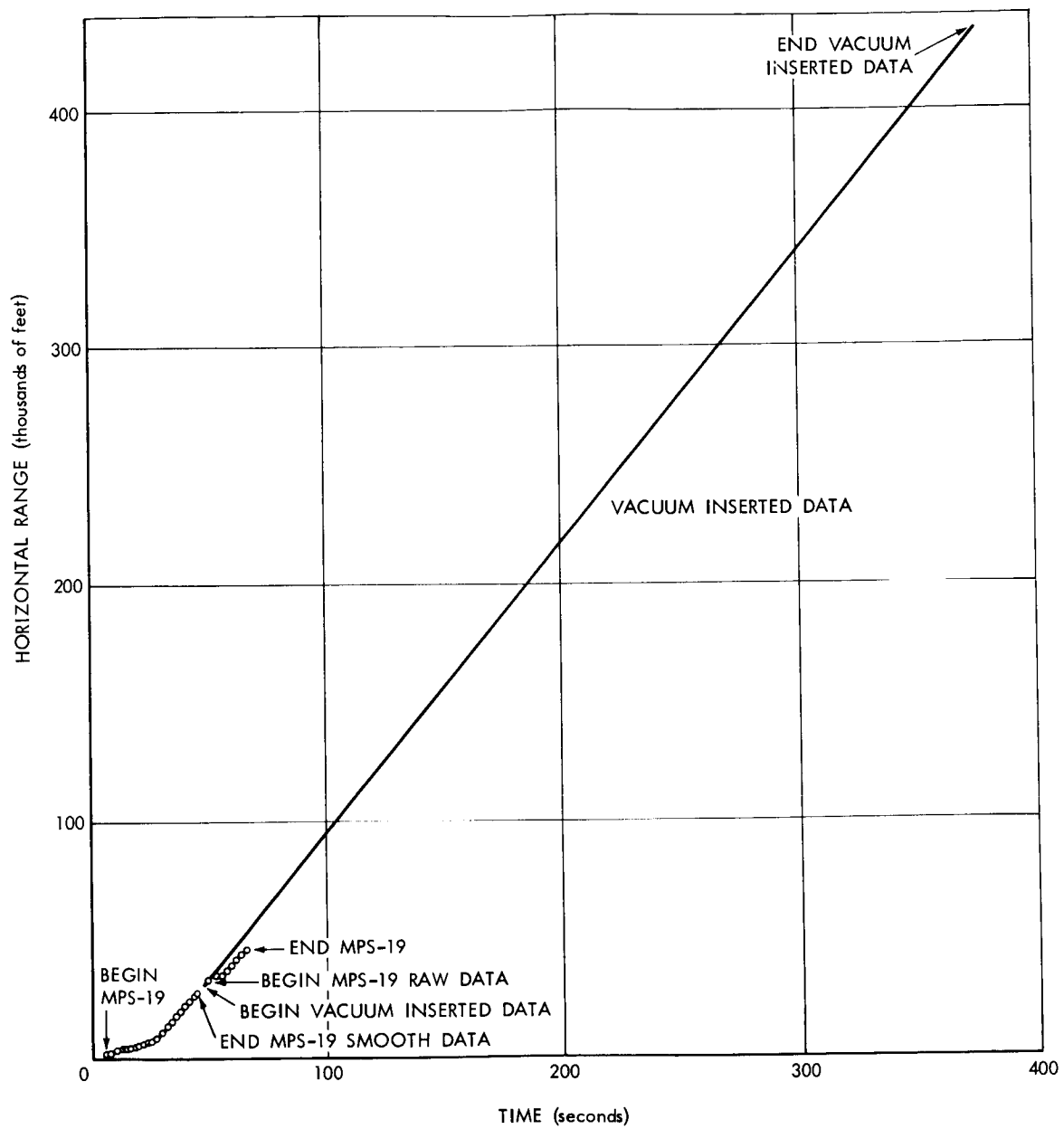


Figure 155. 14.160 GE Radar Plot, Horizontal Range vs Time

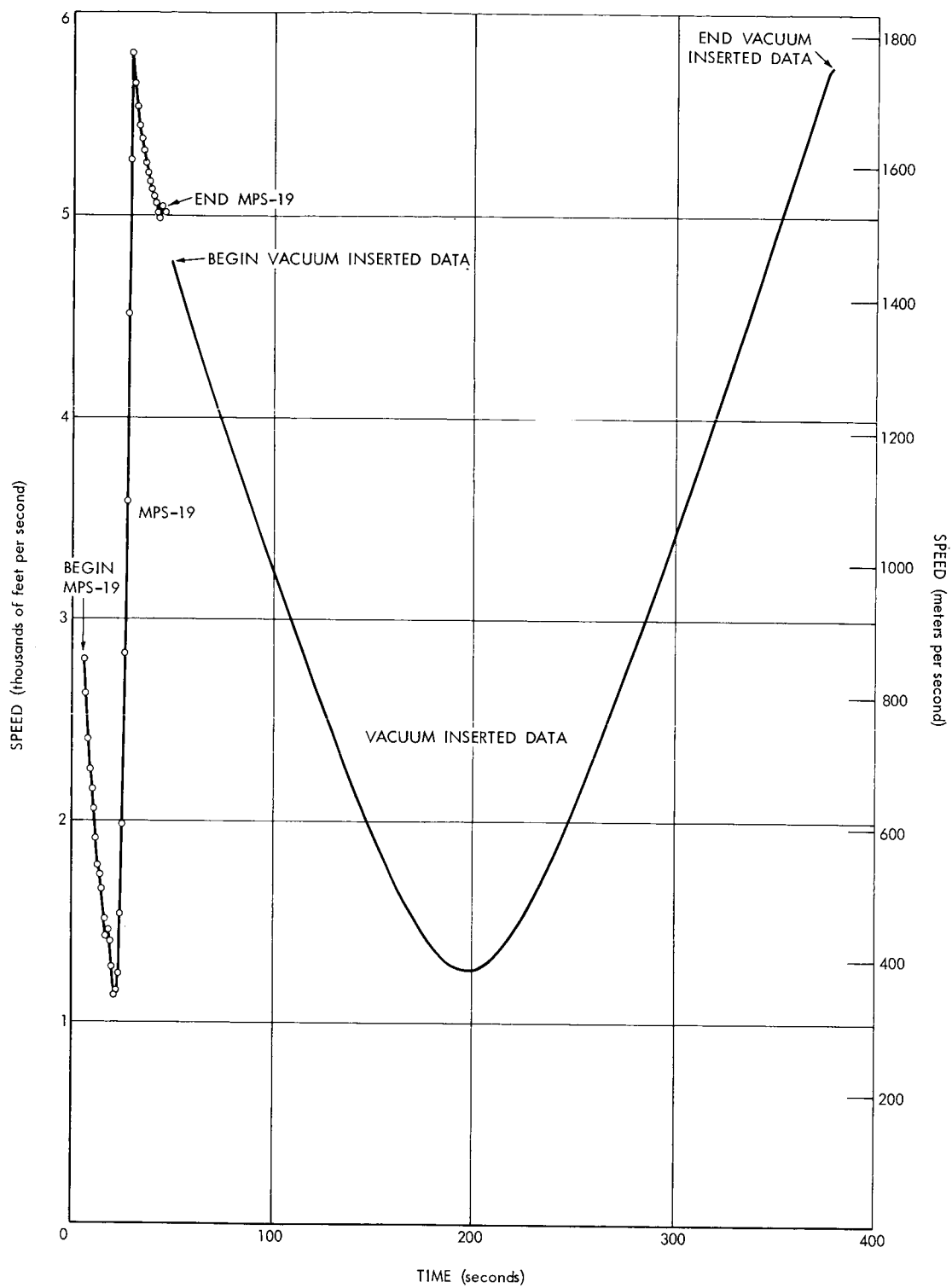


Figure 156. 14.160 GE Radar Plot, Speed vs Time

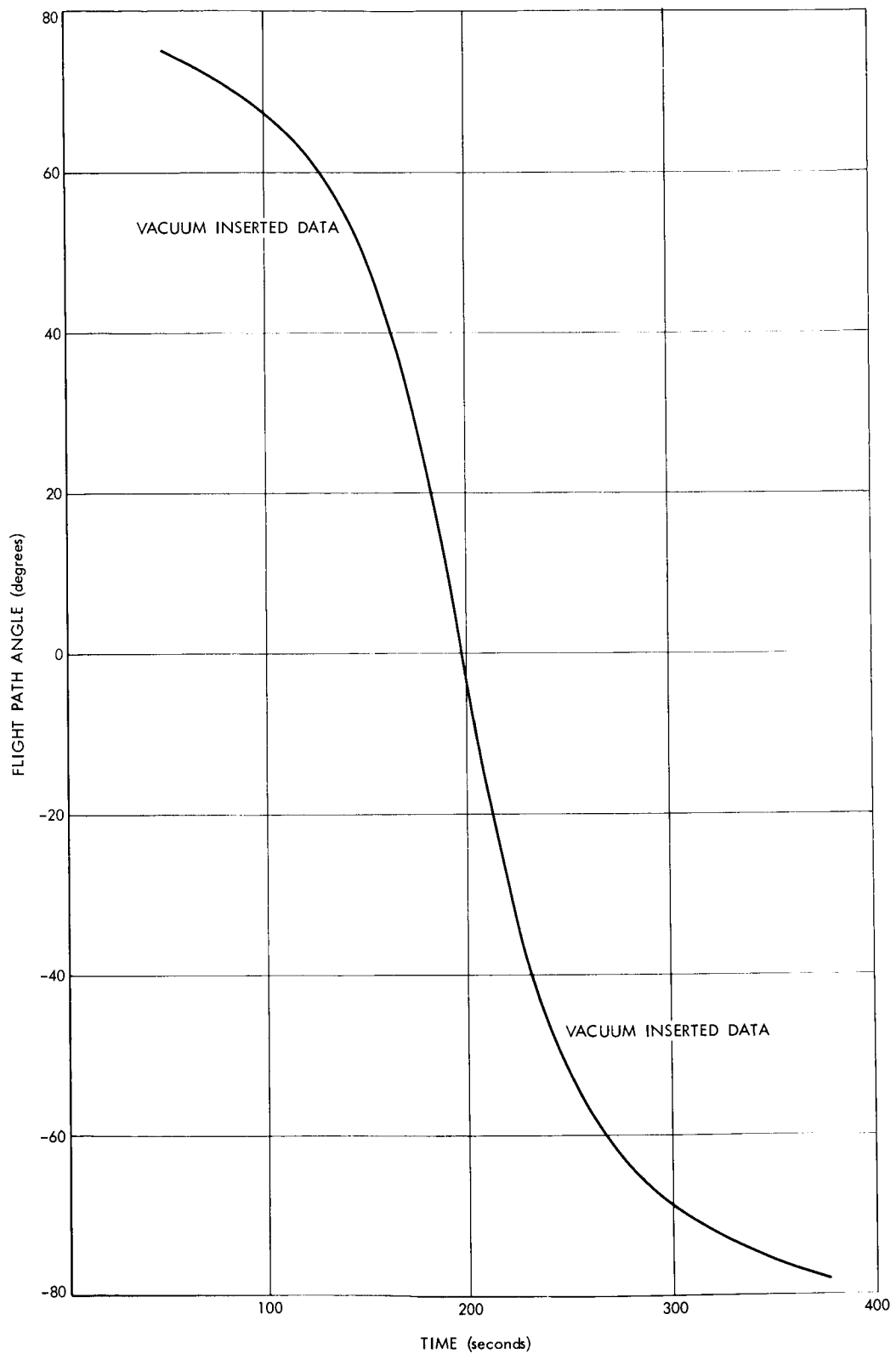


Figure 157. 14.160 GE Radar Plot, Flight Path Angle vs Time



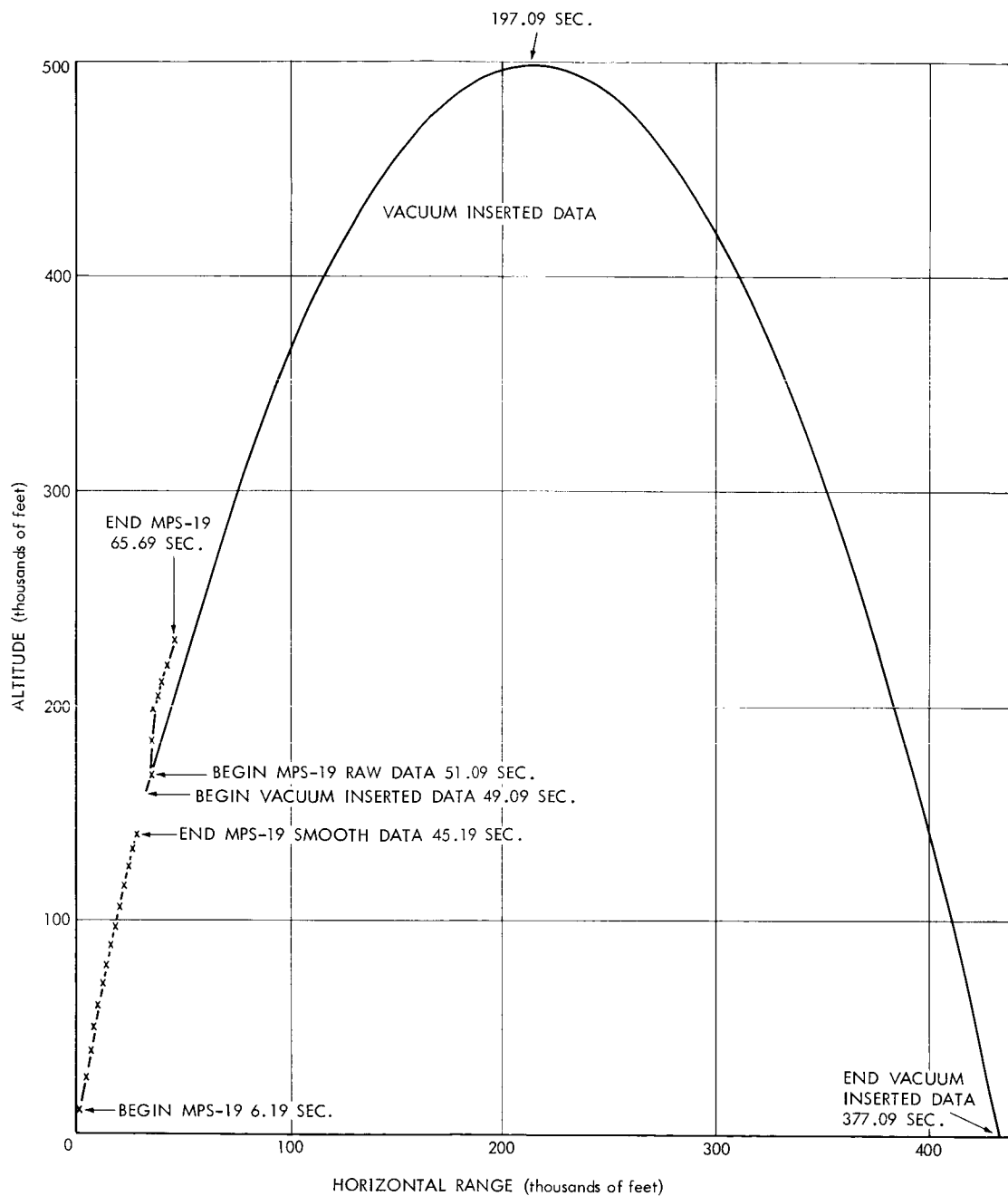


Figure 158. 14.160 GE Radar Plot, Altitude vs Horizontal Range

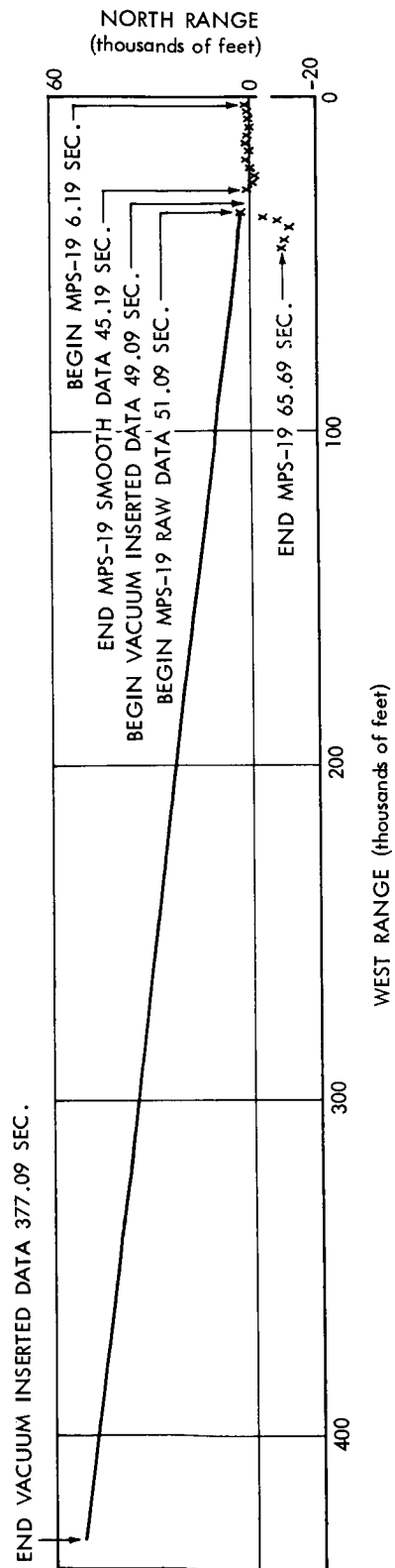


Figure 159. 14.160 GE Radar Plot, North Range vs West Range

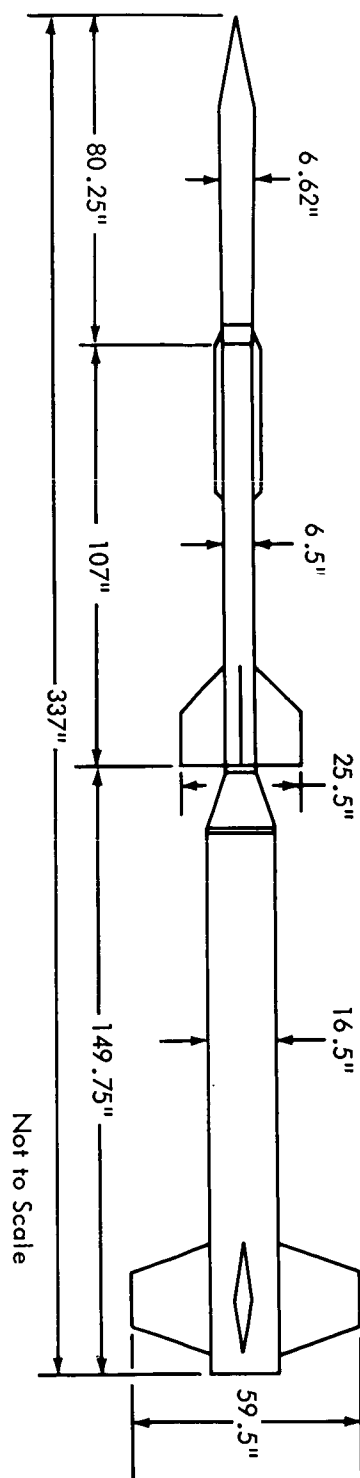


Figure 160. 14.171 GE Sketch

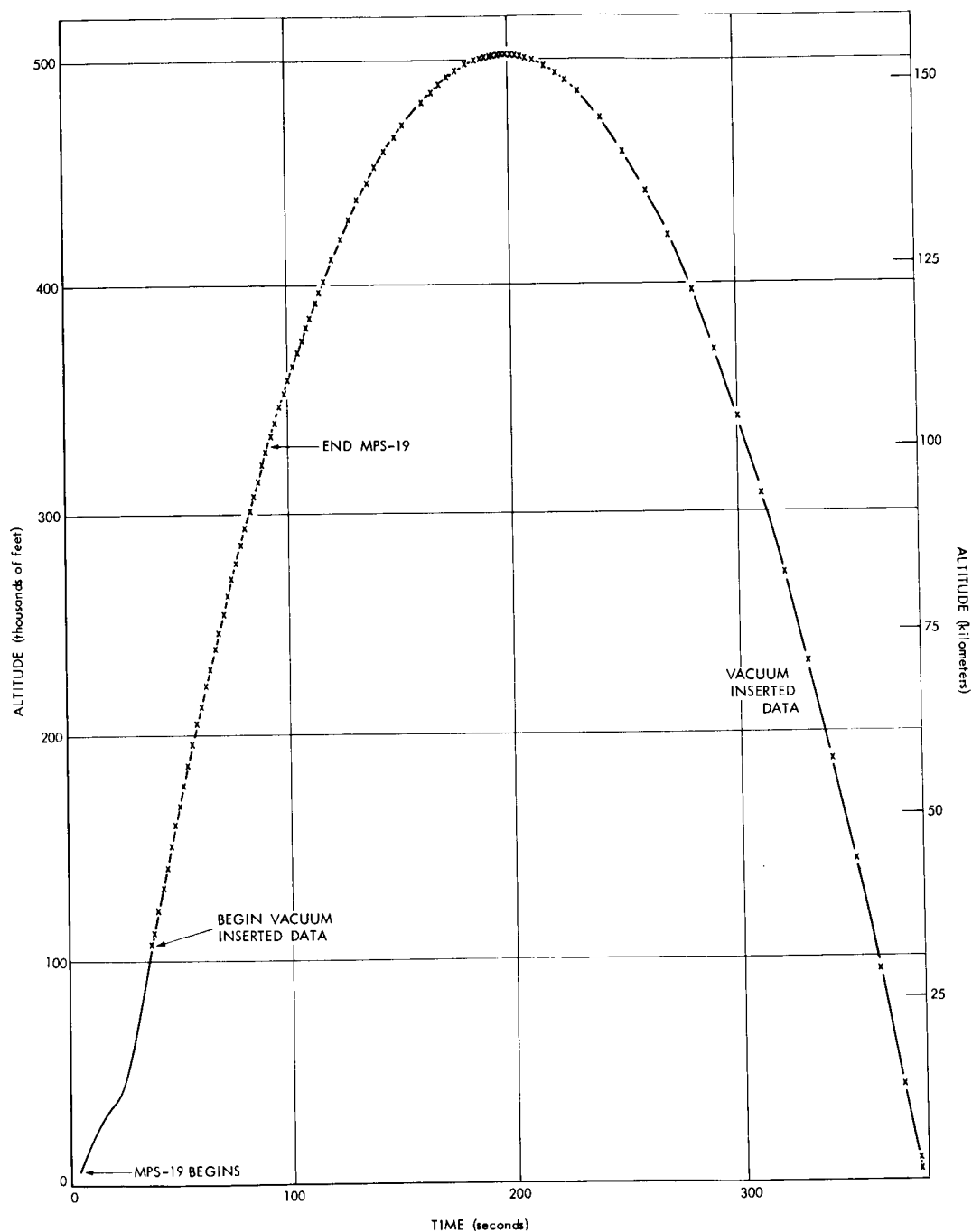


Figure 161. 14.171 GE Radar Plot, Altitude vs Time

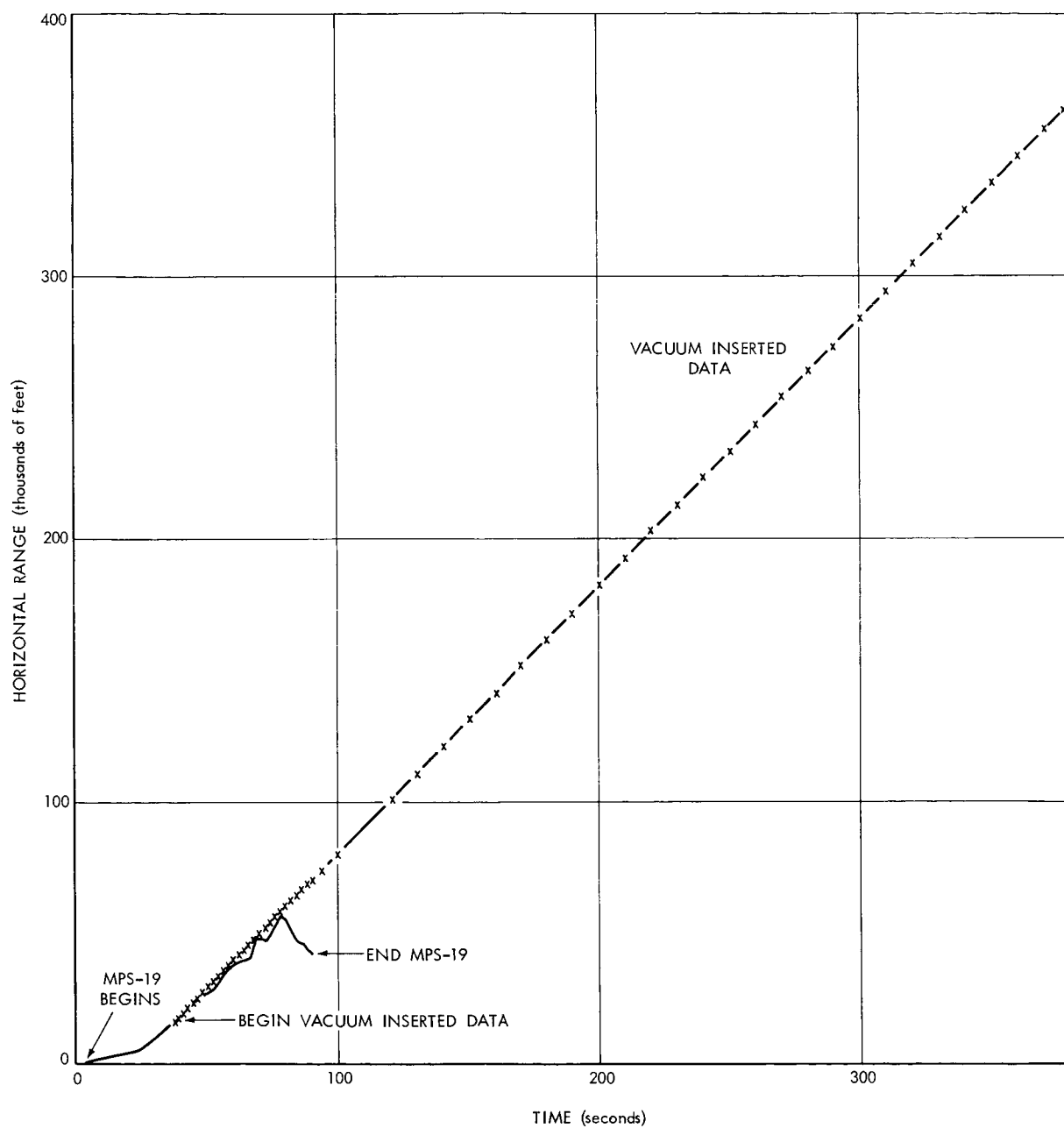


Figure 162. 14.171 GE Radar Plot, Horizontal Range vs Time

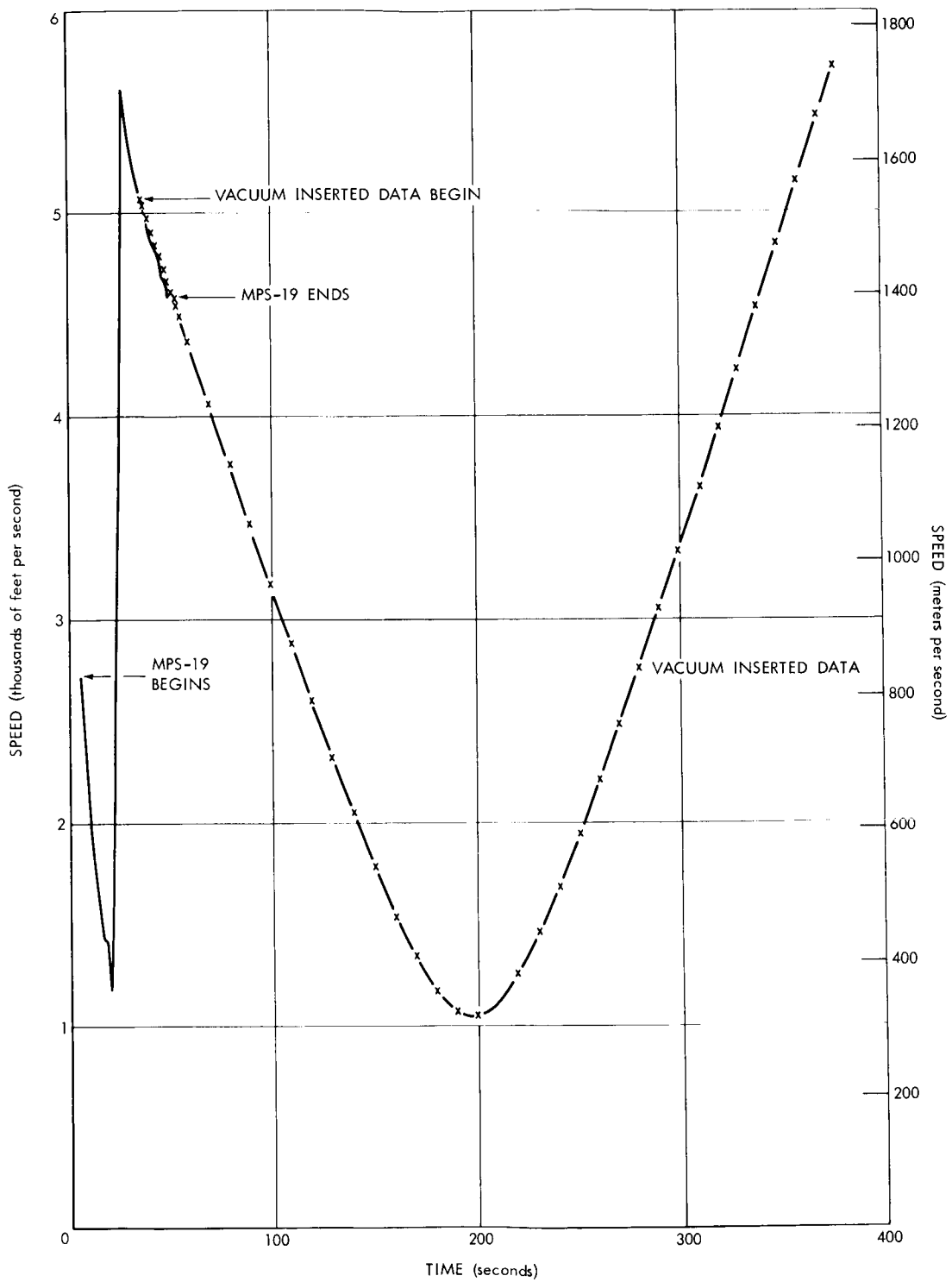


Figure 163. 14.171 GE Radar Plot, Speed vs Time

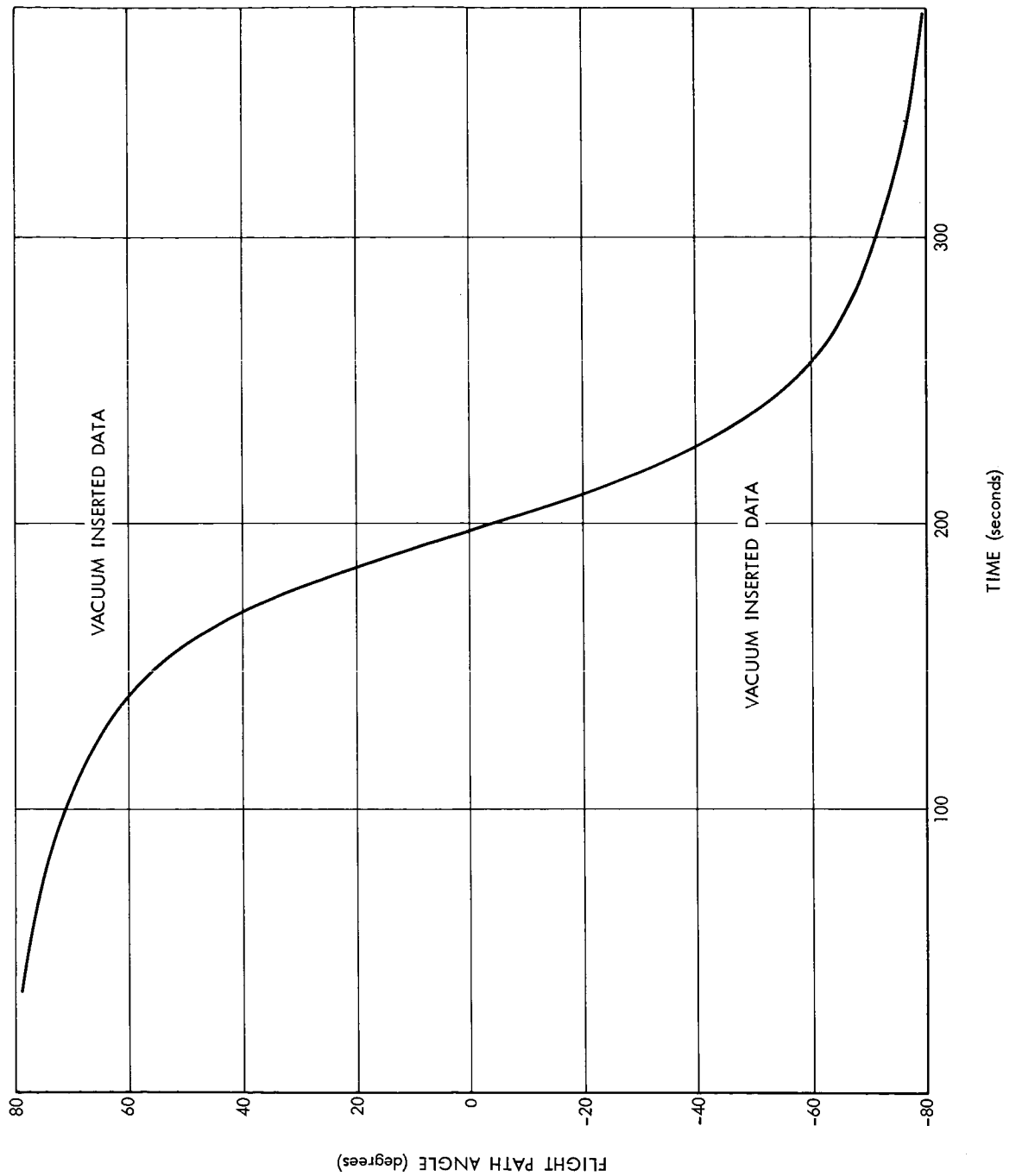


Figure 164. 14.171 GE Radar Plot, Flight Path Angle vs Time

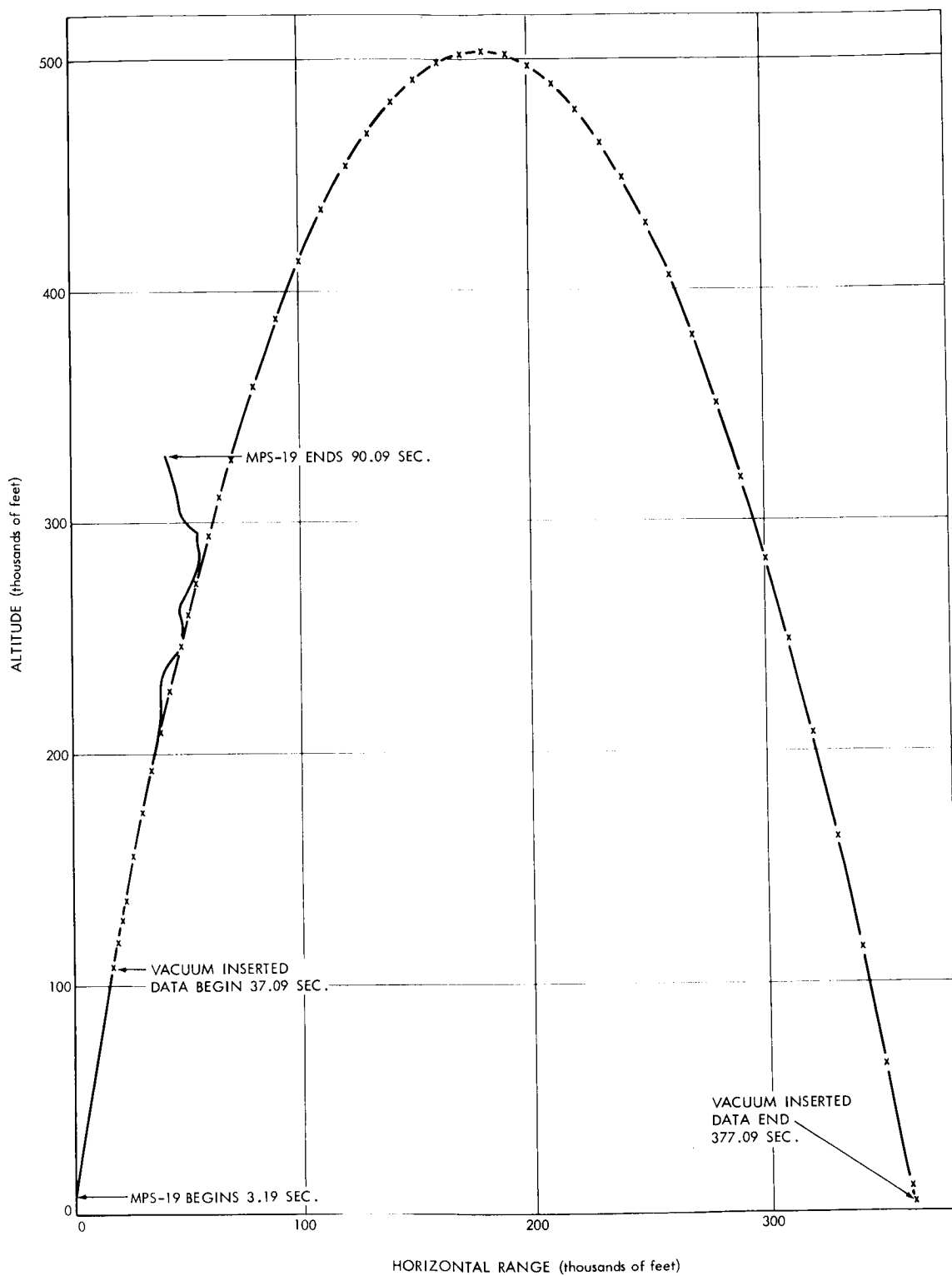


Figure 165. 14.171 GE Radar Plot, Altitude vs Horizontal Range



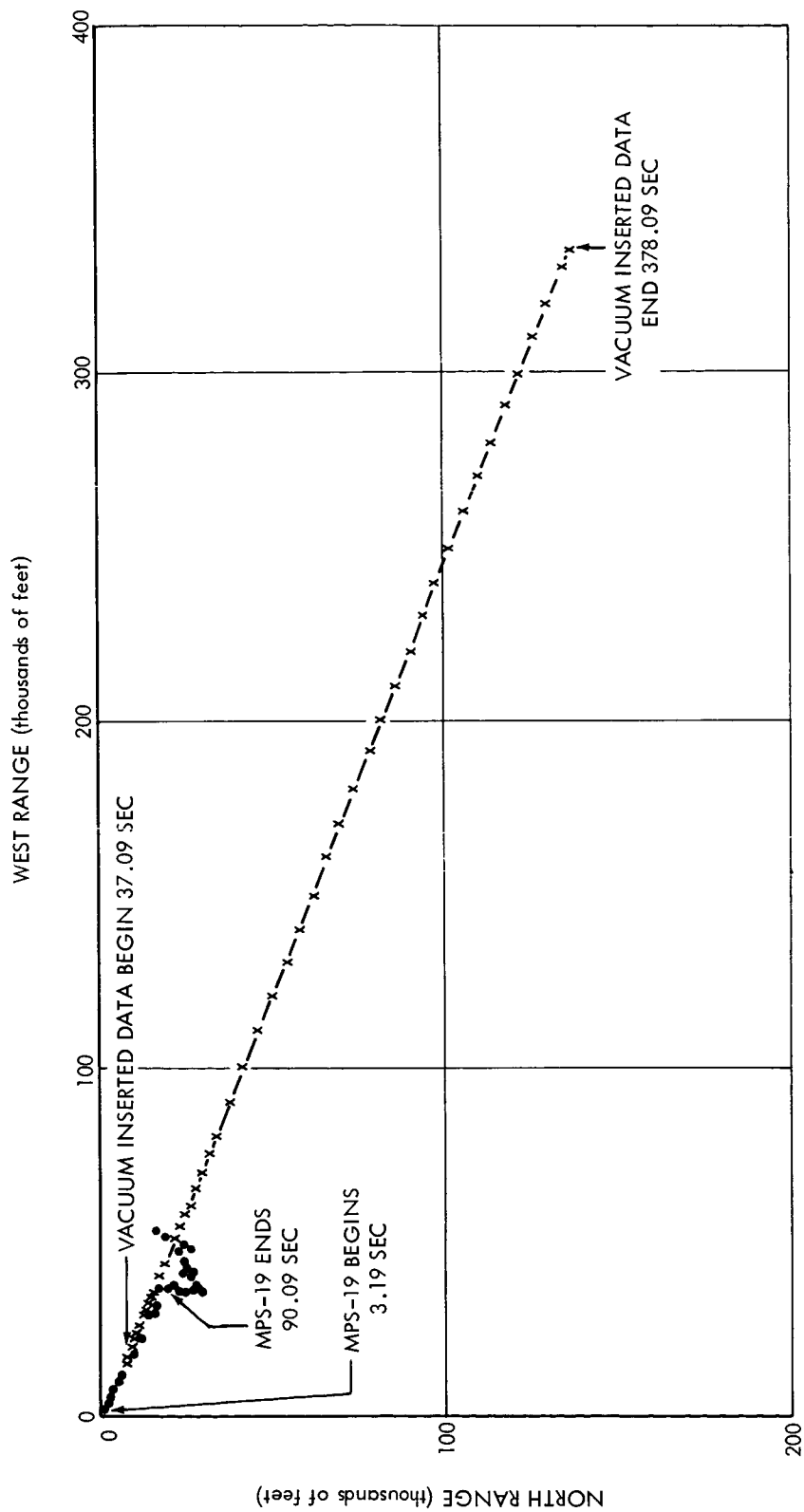


Figure 166. 14.171 GE Radar Plot, North Range vs West Range

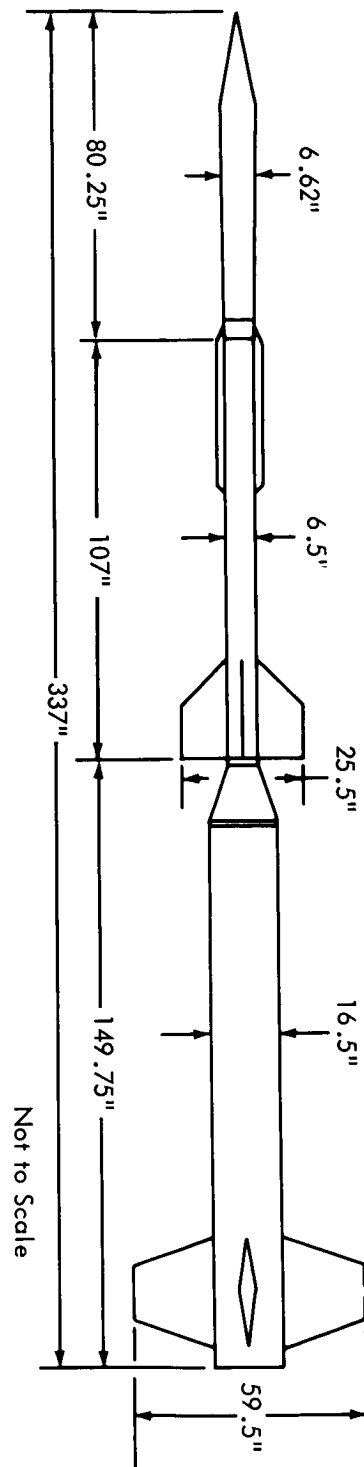


Figure 167. 14.172 GE Sketch

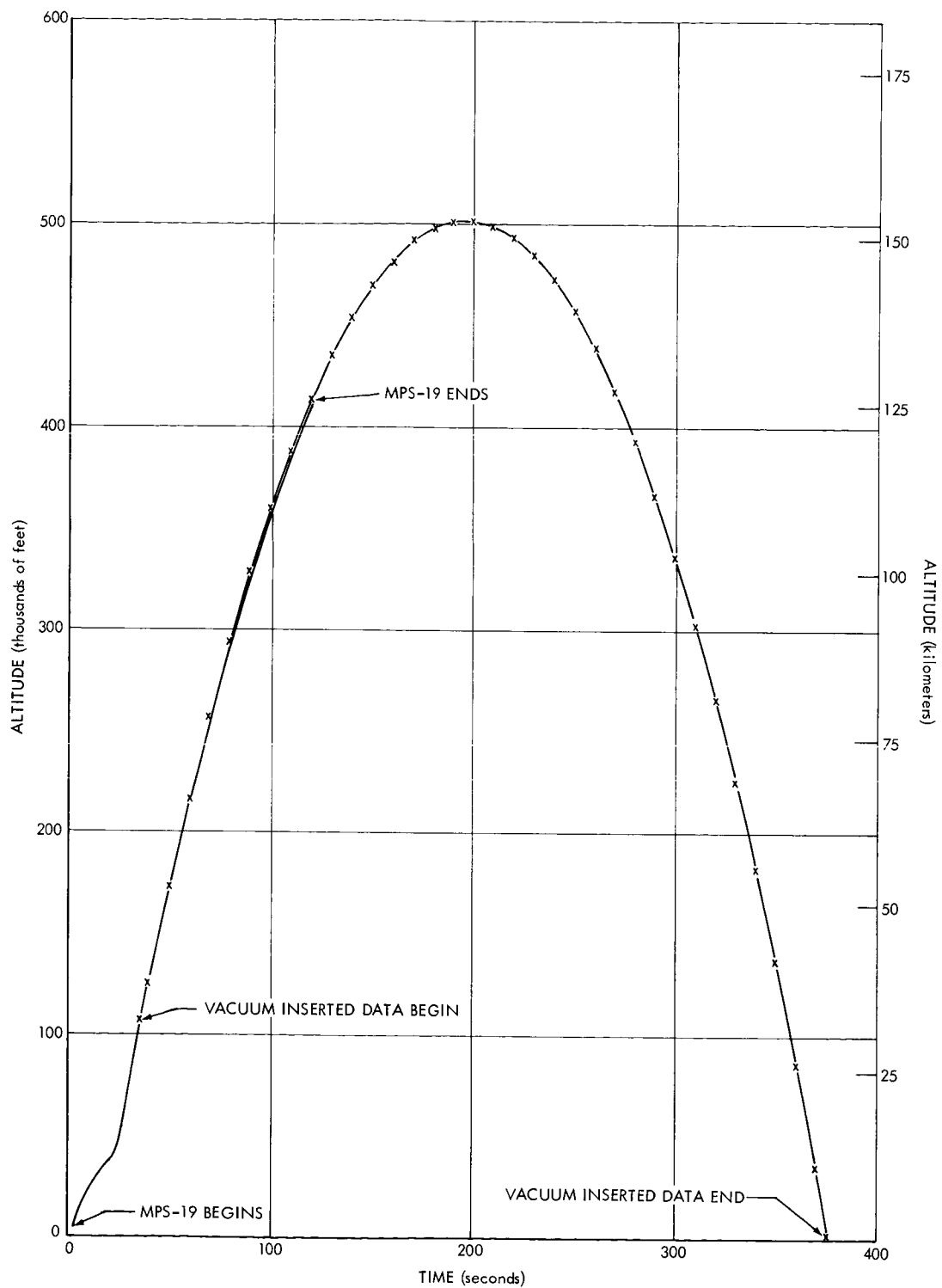


Figure 168. 14.172 GE Radar Plot, Altitude vs Time

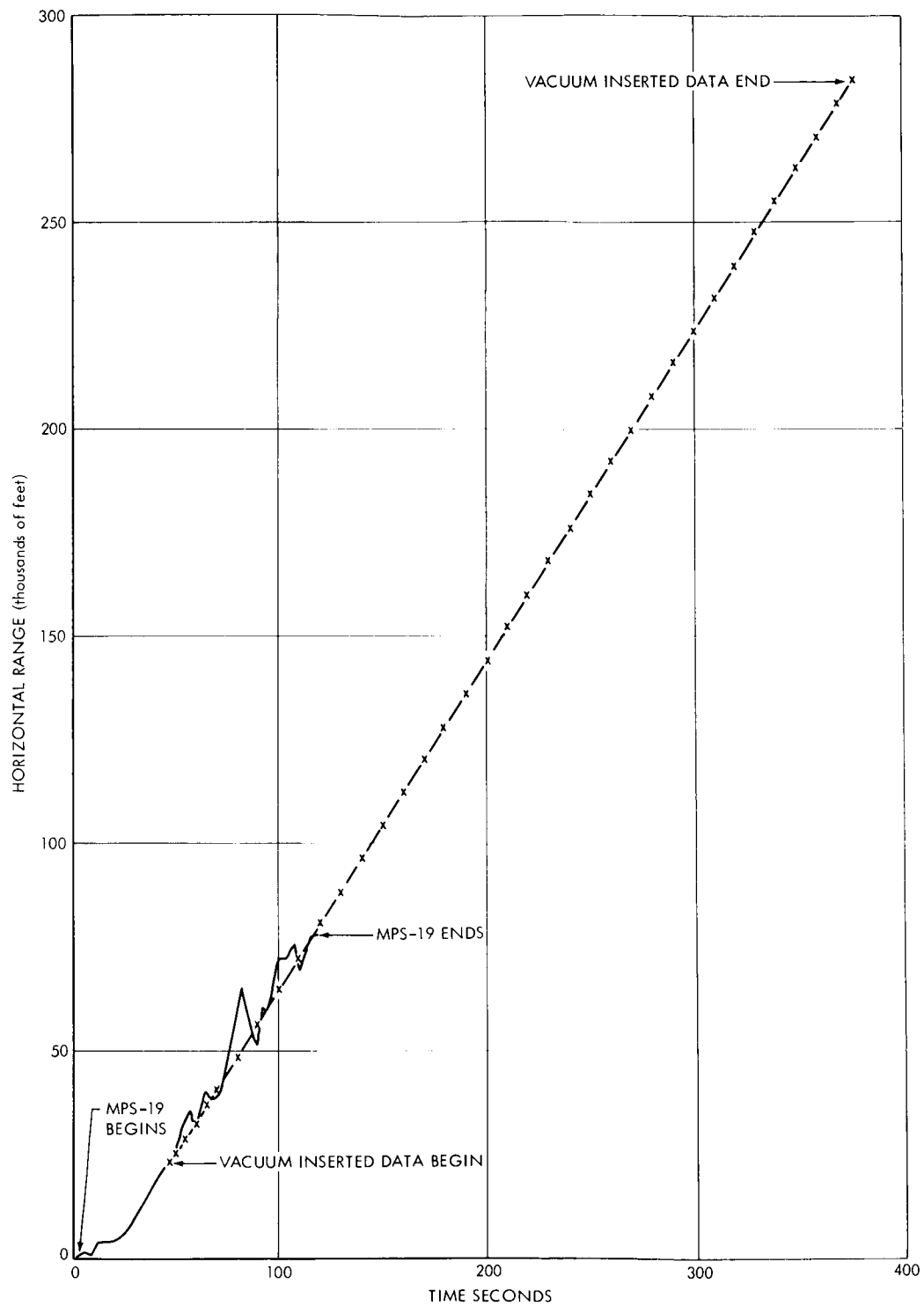


Figure 169. 14.172 GE Radar Plot, Horizontal Range vs Time

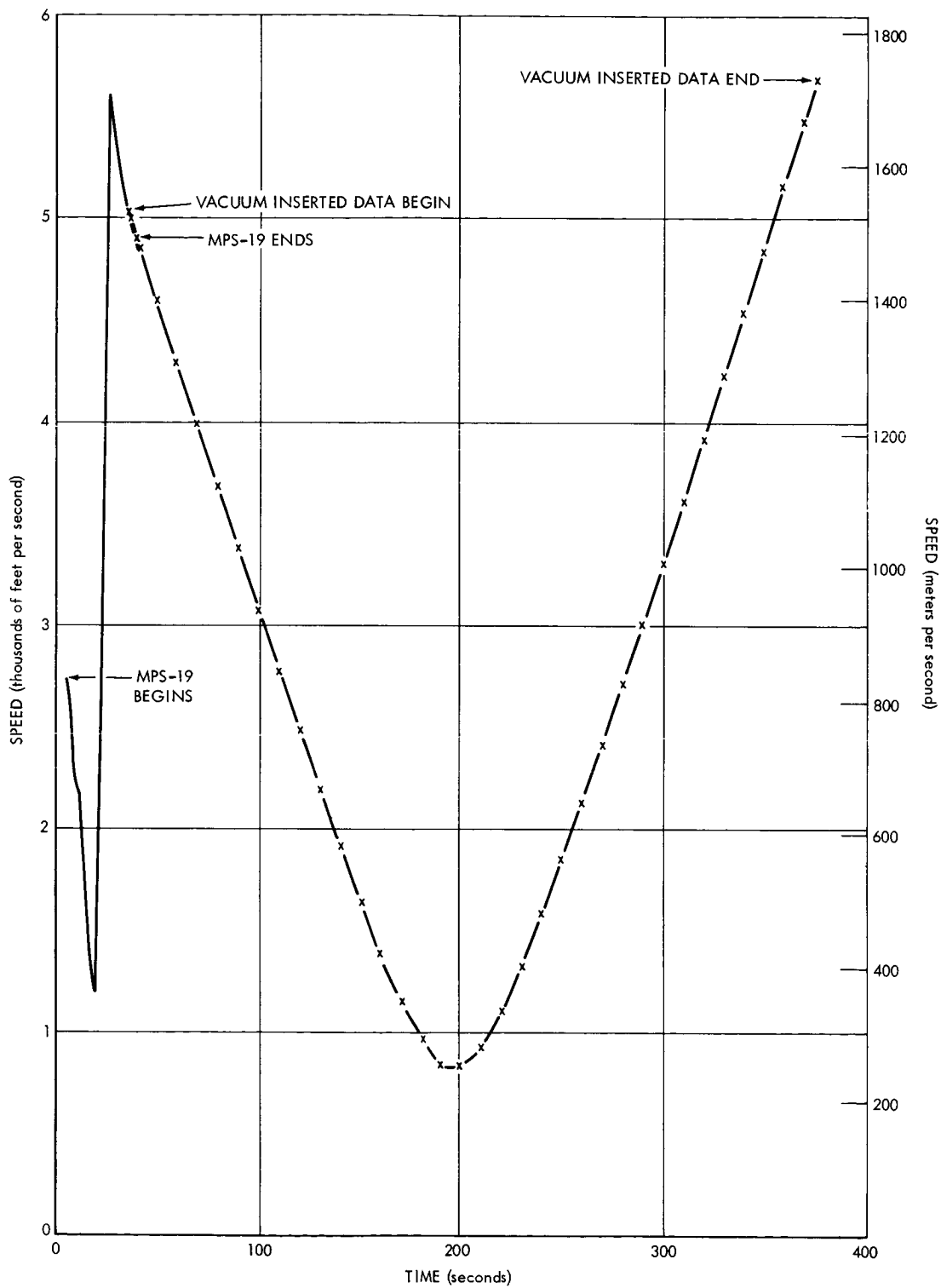


Figure 170. 14.172 GE Radar Plot, Speed vs Time

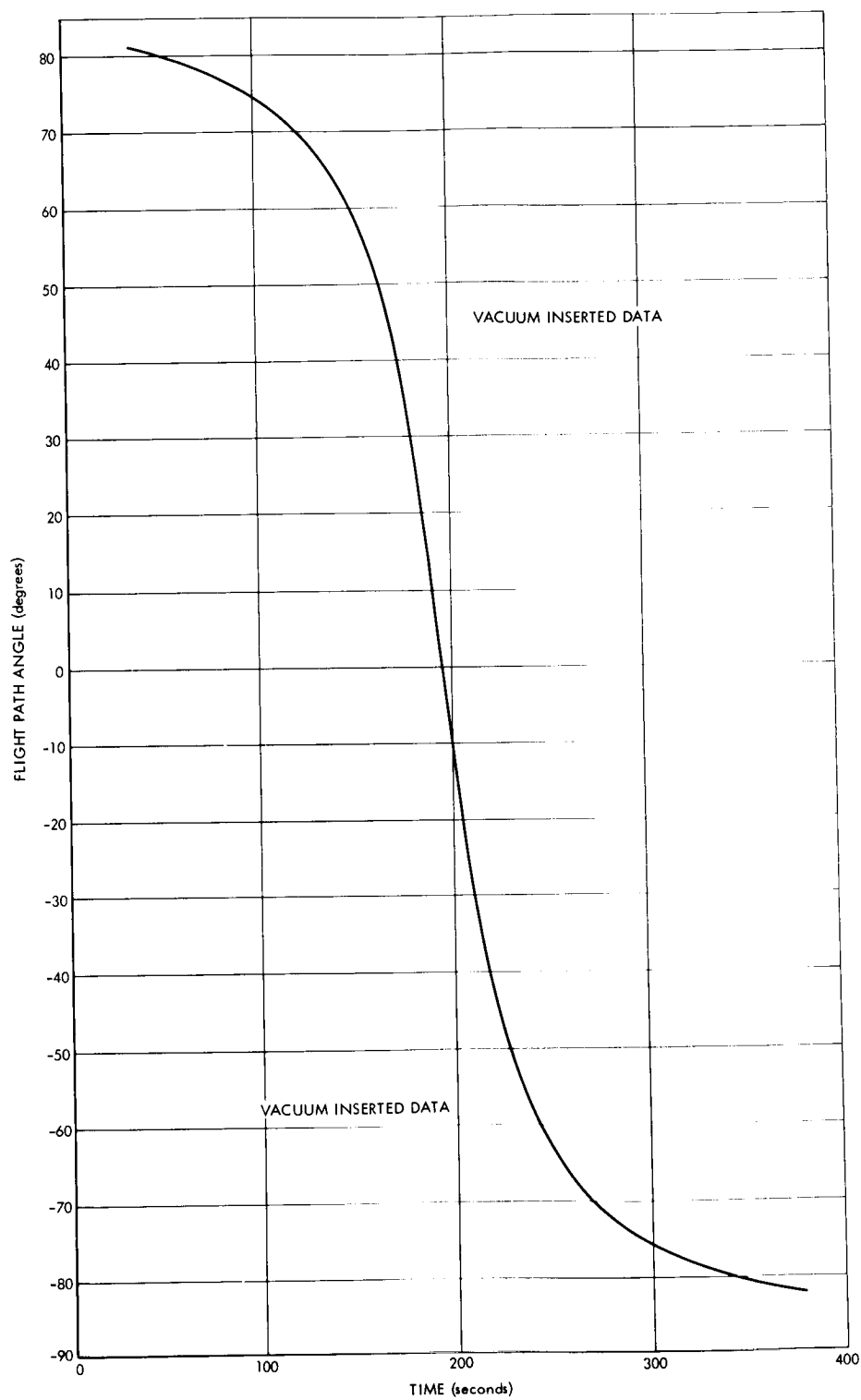


Figure 171. 14.172 GE Radar Plot, Flight Path Angle vs Time

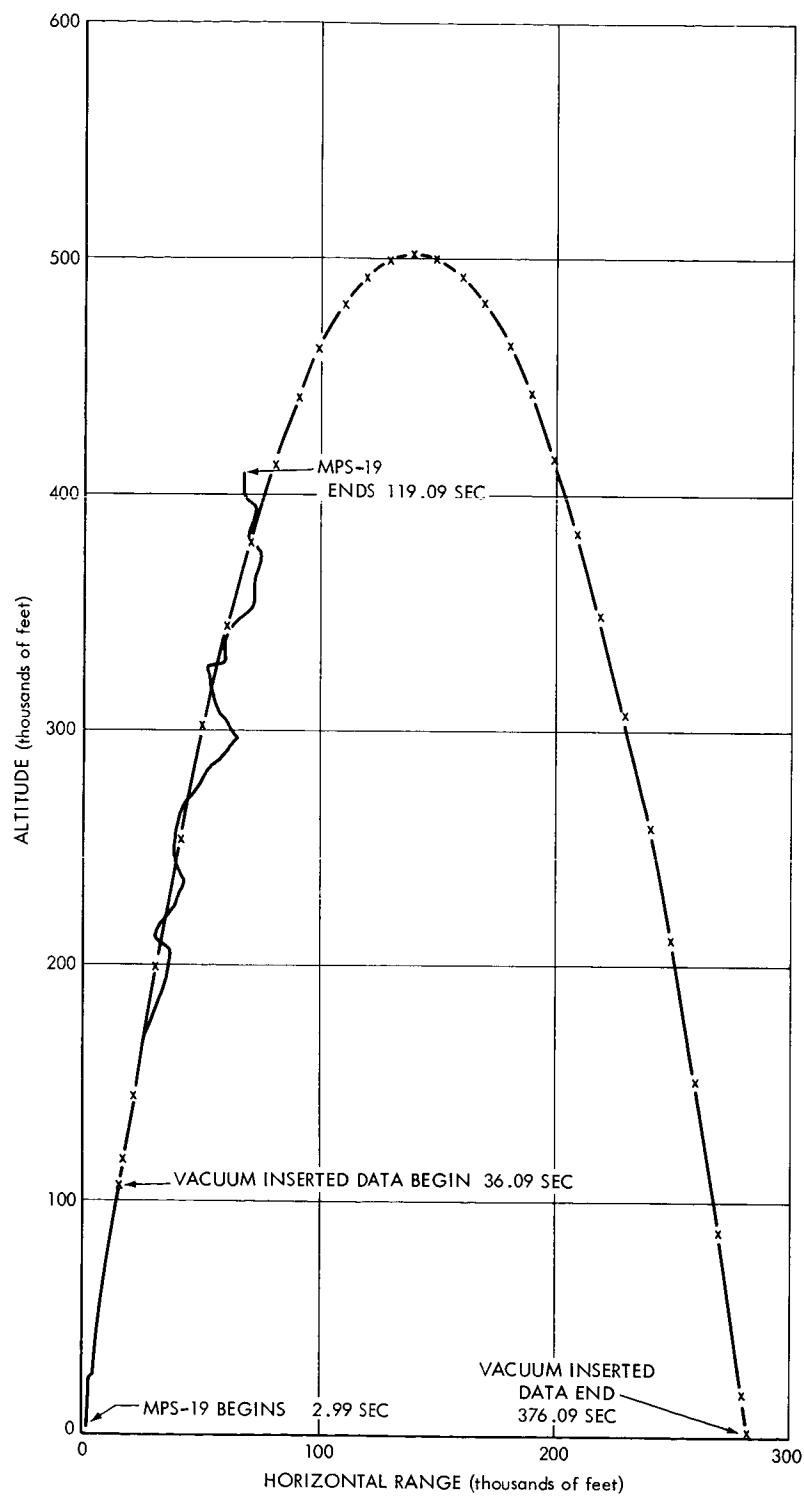


Figure 172. 14.172 GE Radar Plot, Altitude vs Horizontal Range

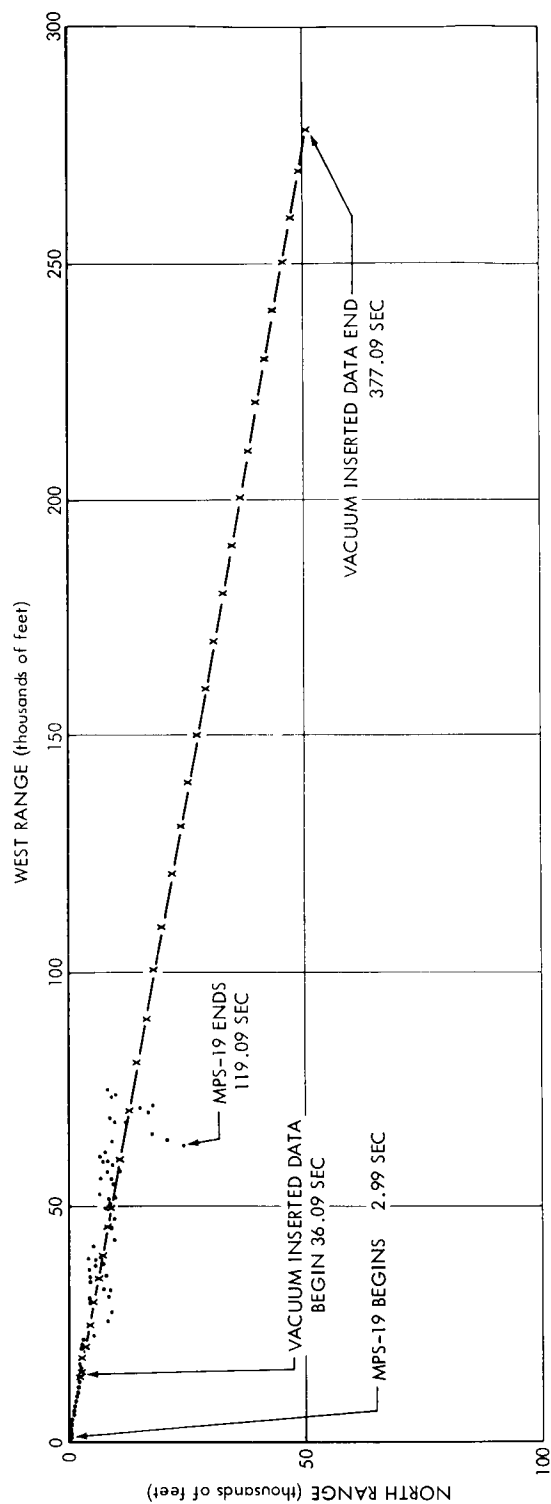


Figure 173. 14.172 GE Radar Plot, North Range vs West Range



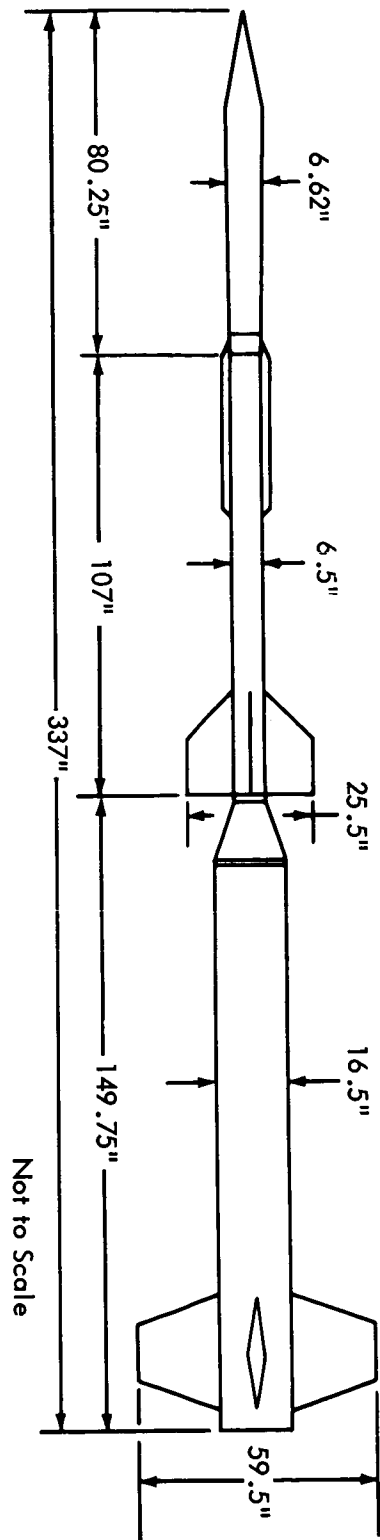


Figure 174. 14.173 GE Sketch

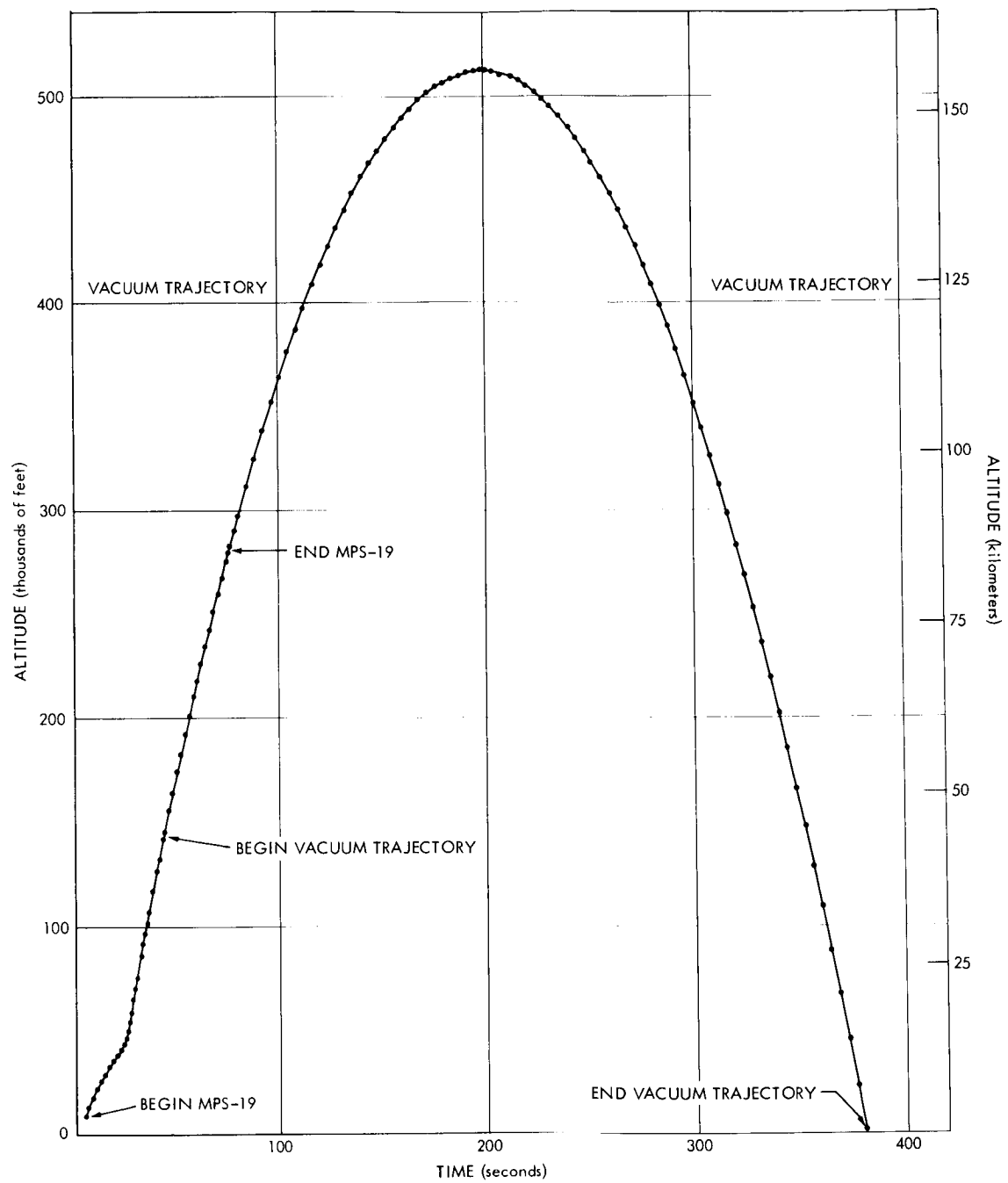


Figure 175. 14.173 GE Radar Plot, Altitude vs Time

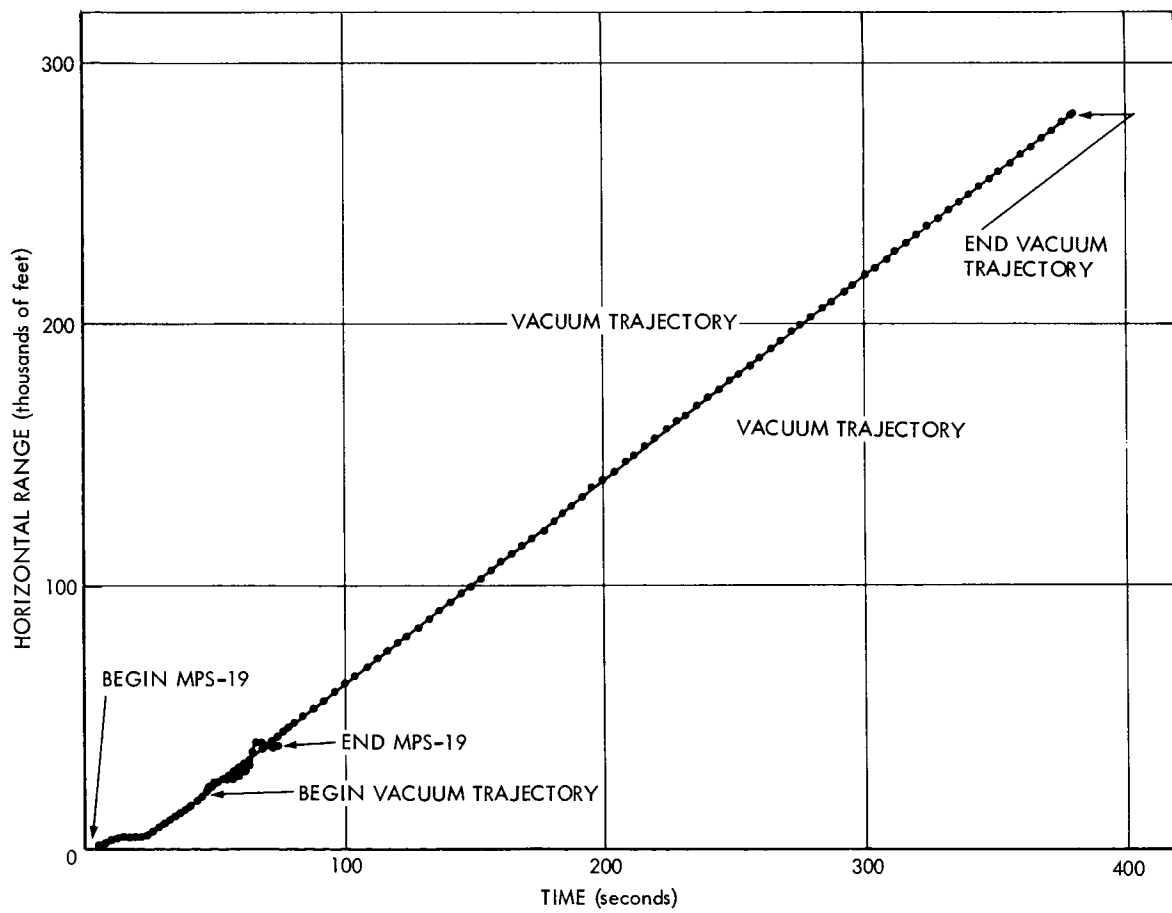


Figure 176. 14.173 GE Radar Plot, Horizontal Range vs Time

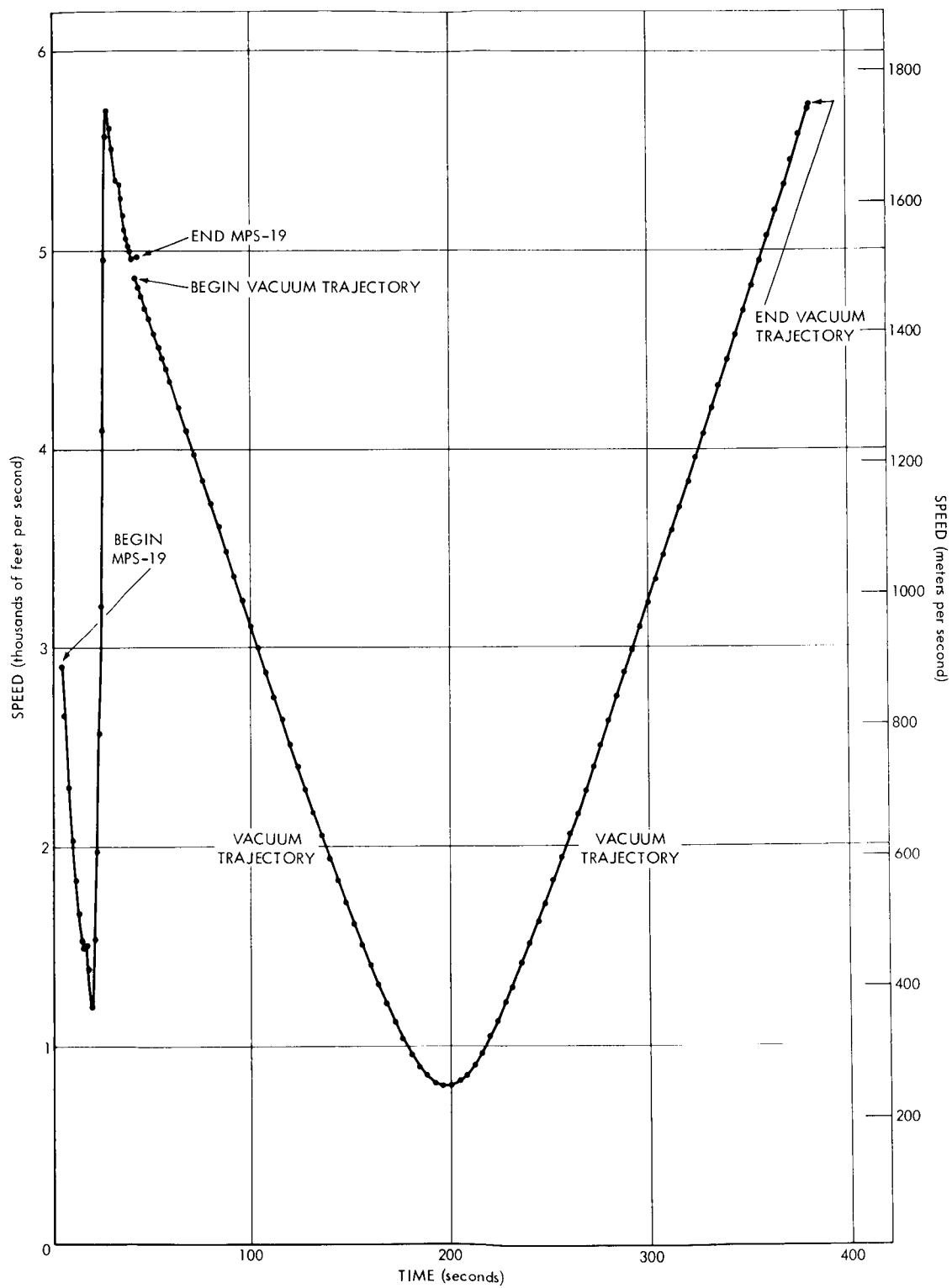


Figure 177. 14.173 GE Radar Plot, Speed vs Time

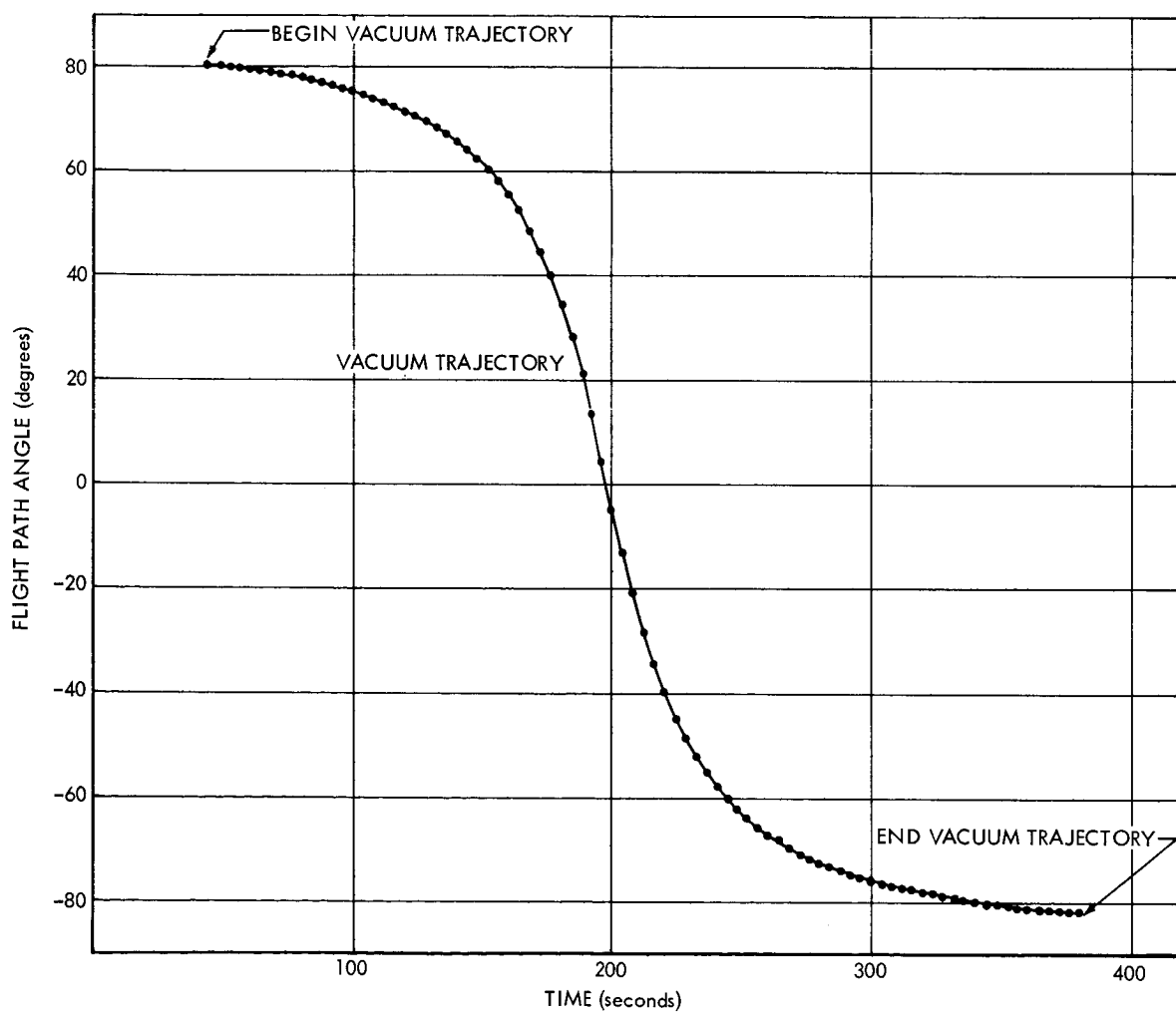


Figure 178. 14.173 GE Radar Plot, Flight Path Angle vs Time

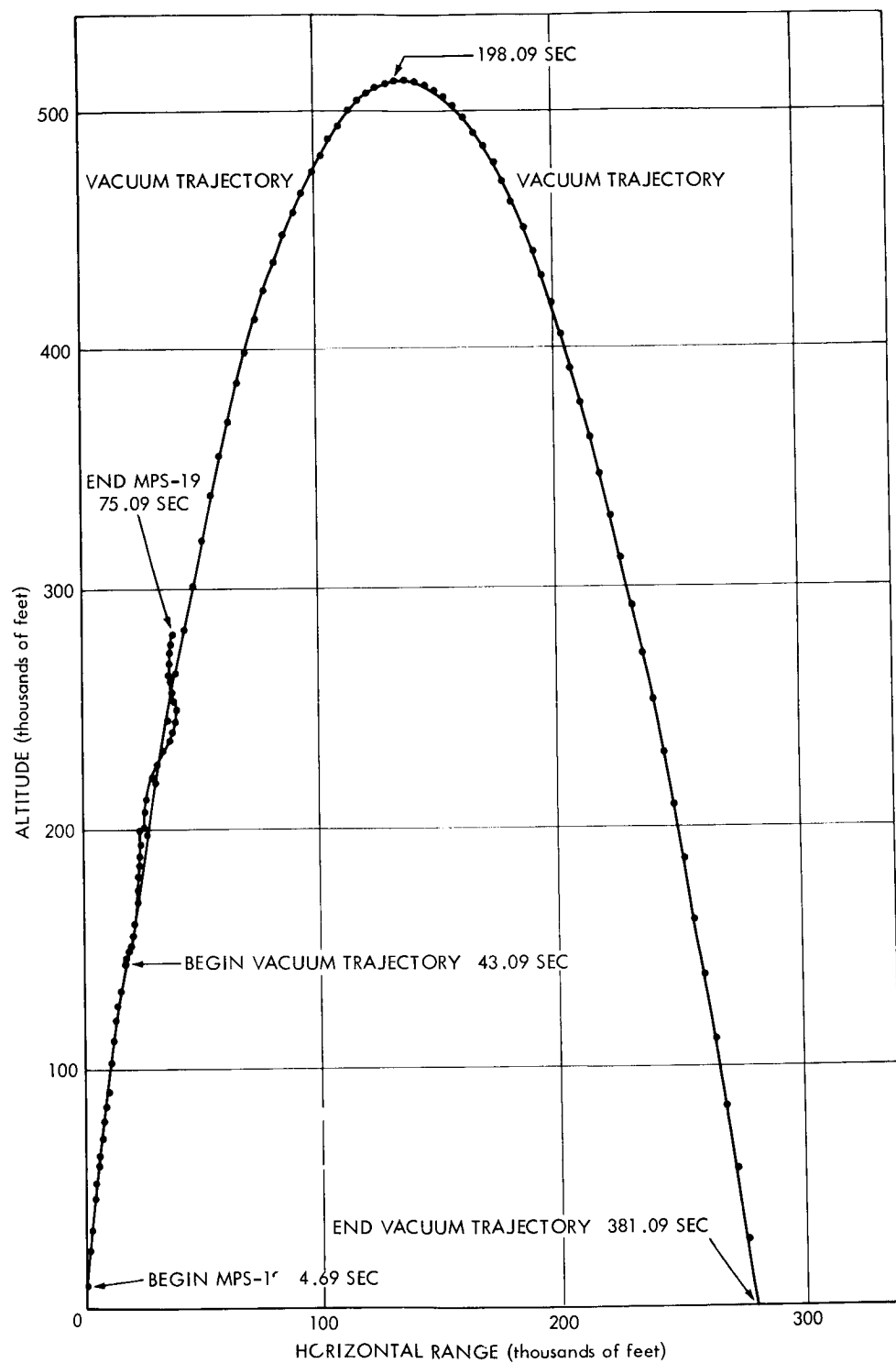


Figure 179. 14.173 GE Radar Plot, Altitude vs Horizontal Range

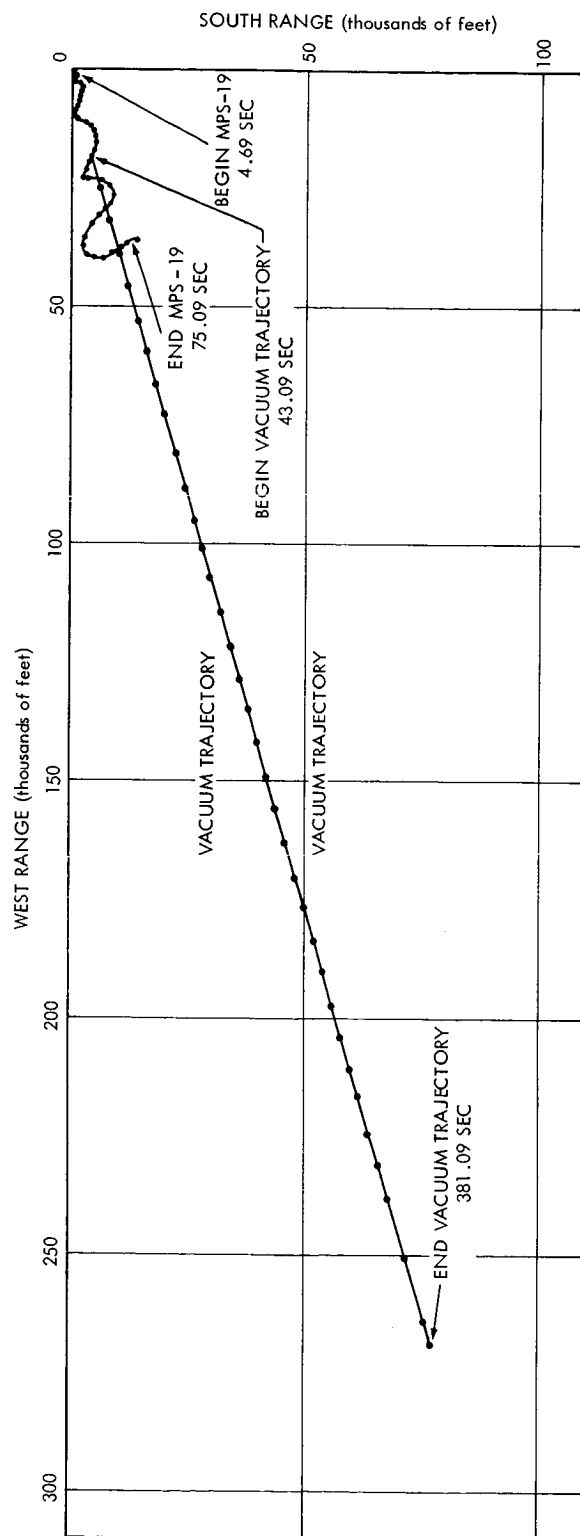


Figure 180. 14.173 GE Radar Plot, South Range vs West Range

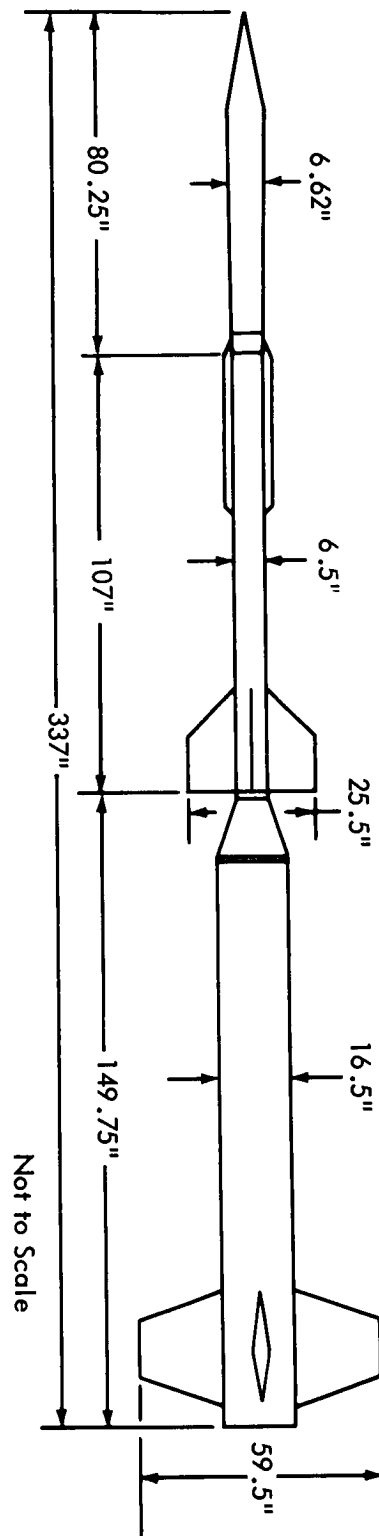


Figure 181. 14.174 GE Sketch



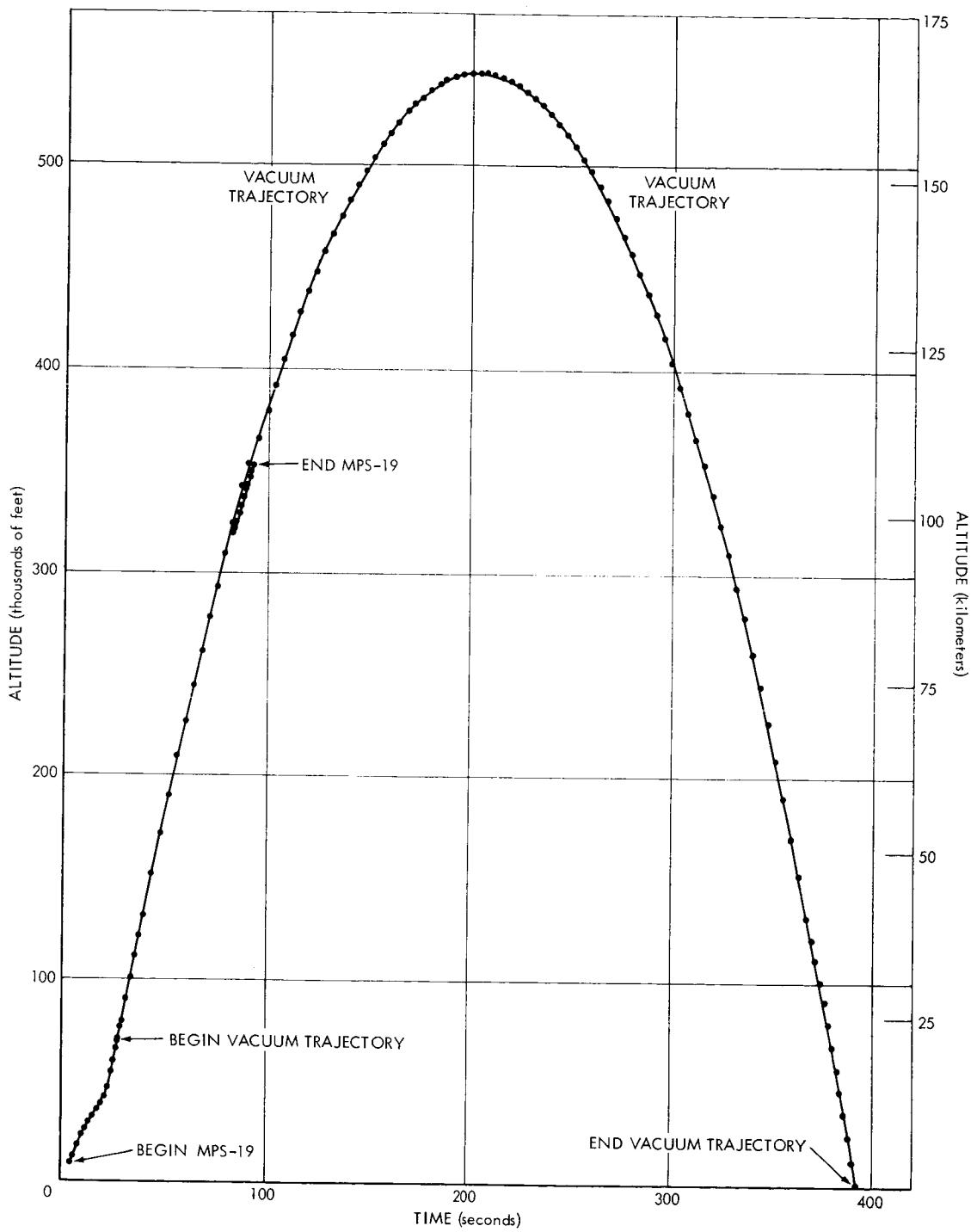


Figure 182. 14.174 GE Radar Plot, Altitude vs Time

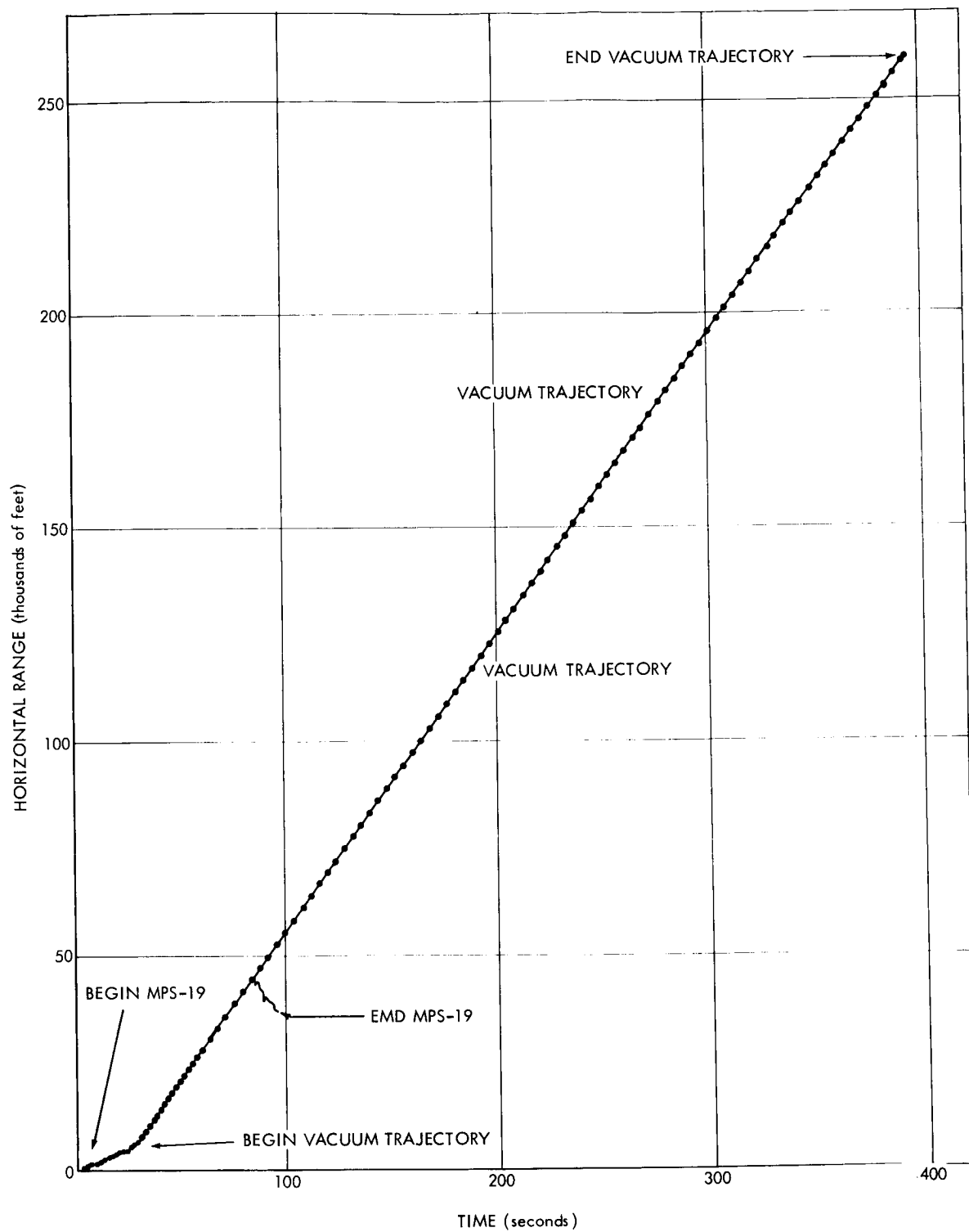


Figure 183. 14.174 GE Radar Plot, Horizontal Range vs Time

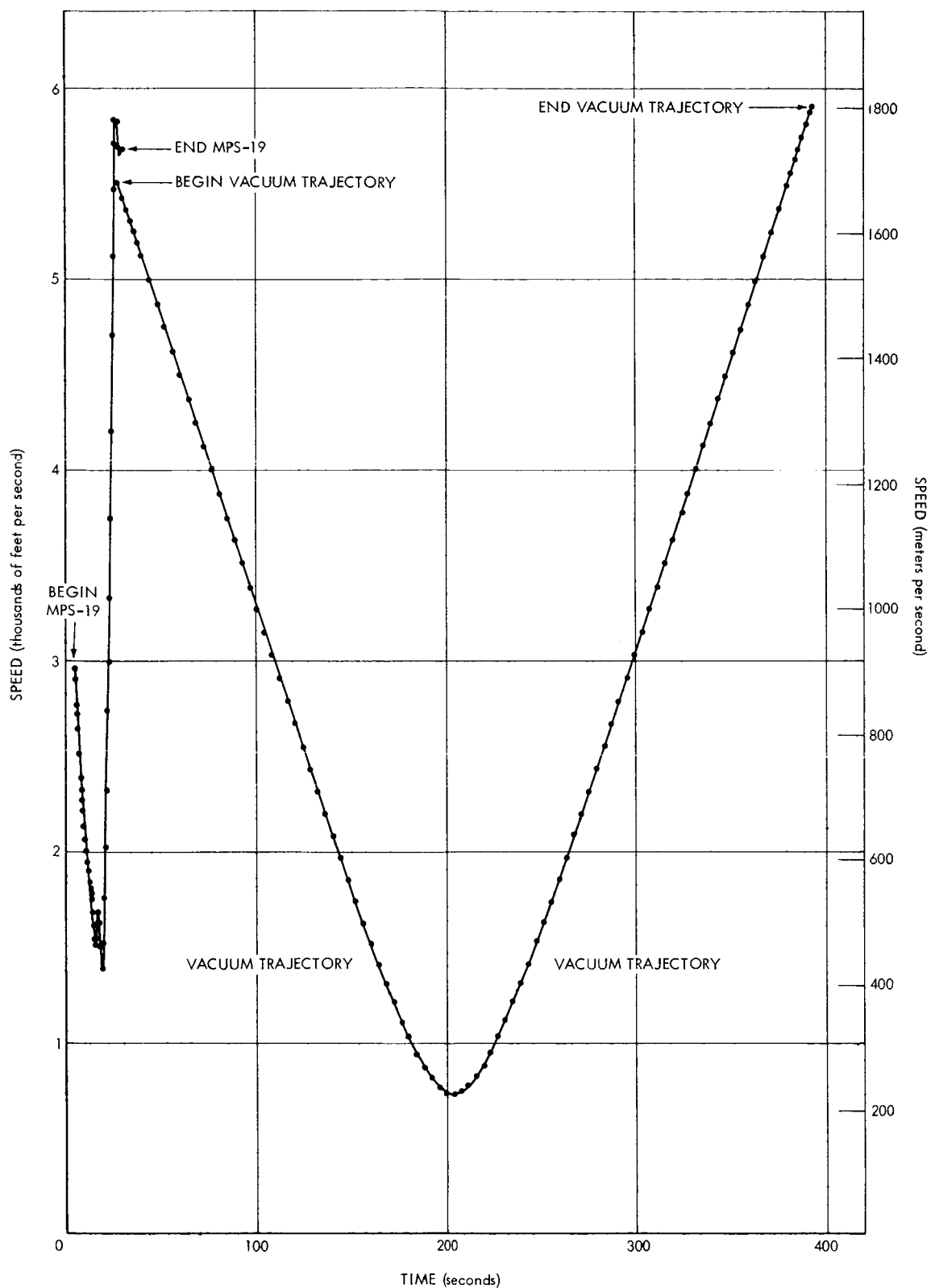


Figure 184. 14.174 GE Radar Plot, Speed vs Time

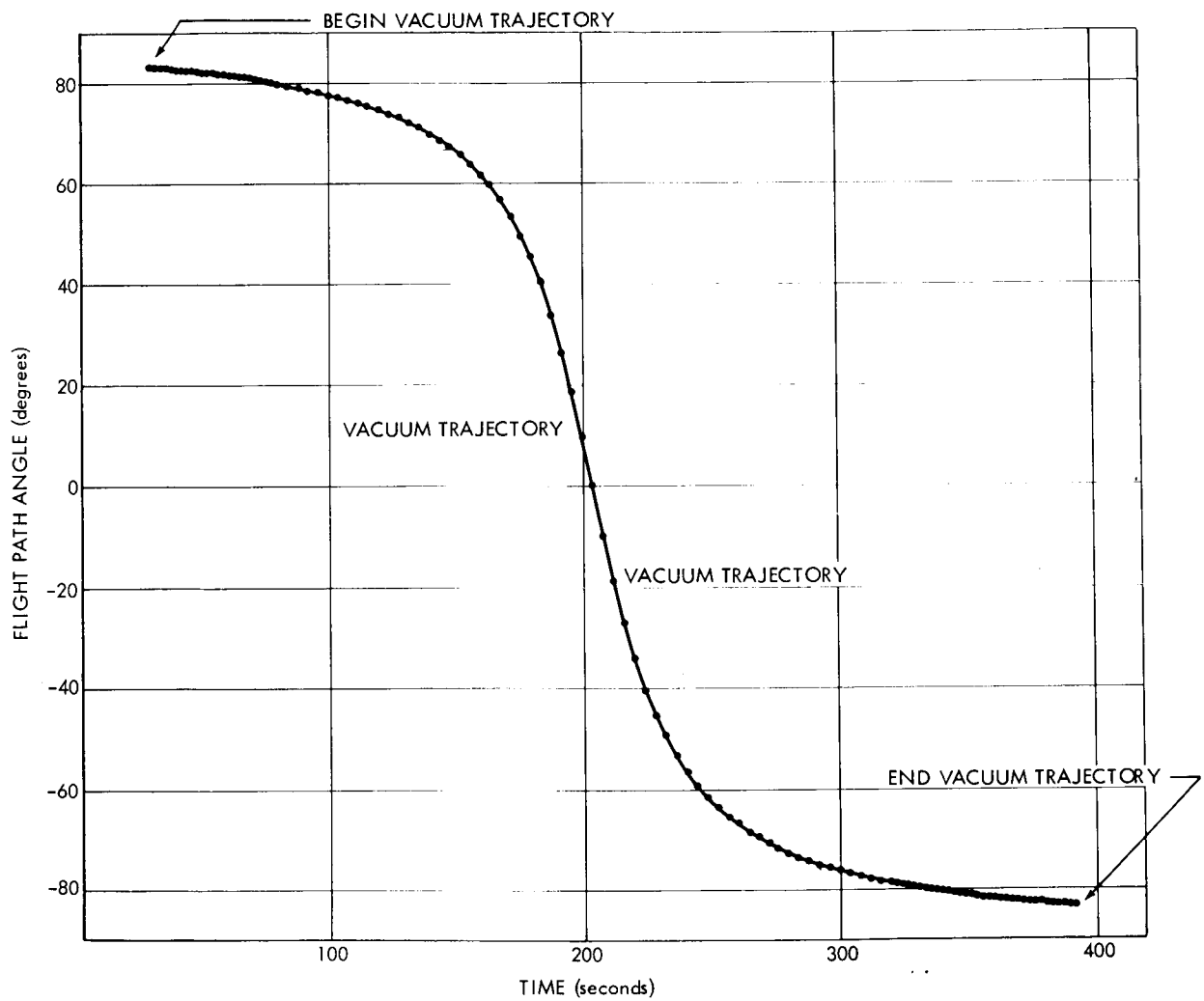


Figure 185. 14.174 GE Radar Plot, Flight Path Angle vs Time

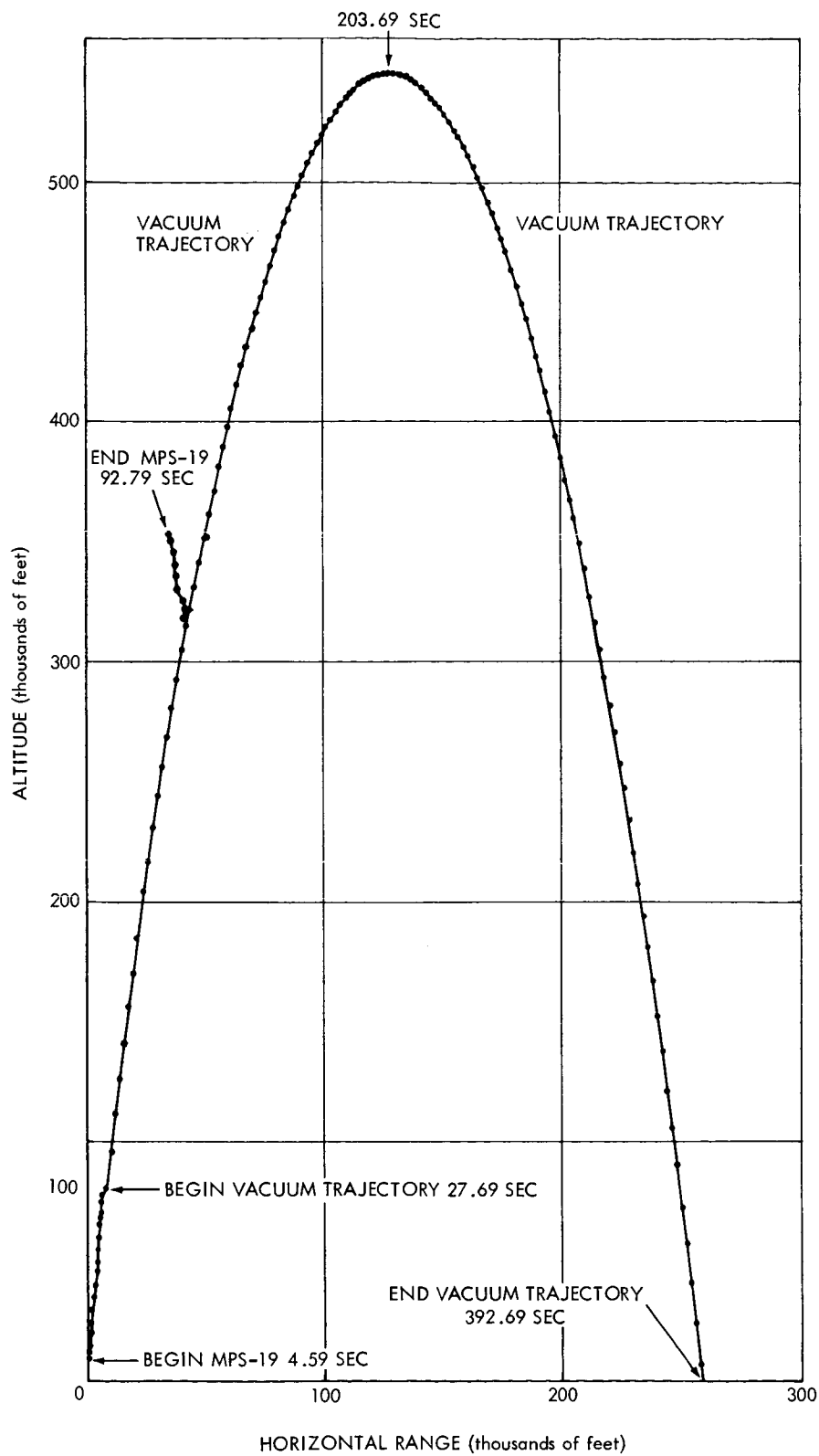


Figure 186. 14.174 GE Radar Plot, Altitude vs Horizontal Range

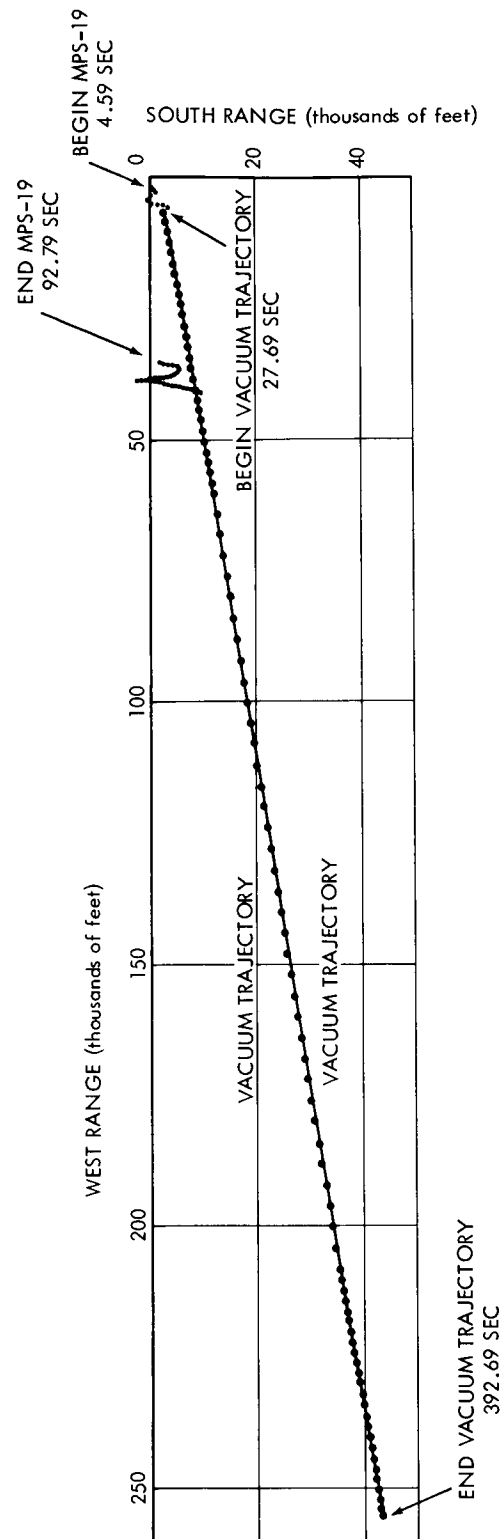


Figure 187. 14.174 GE Radar Plot, South Range vs West Range

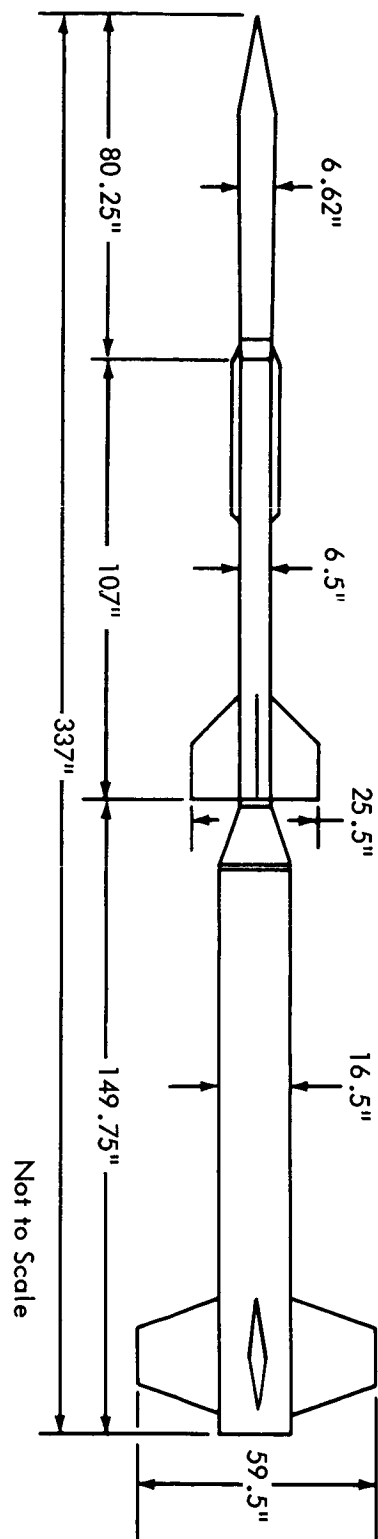


Figure 188. 14.175 GE Sketch

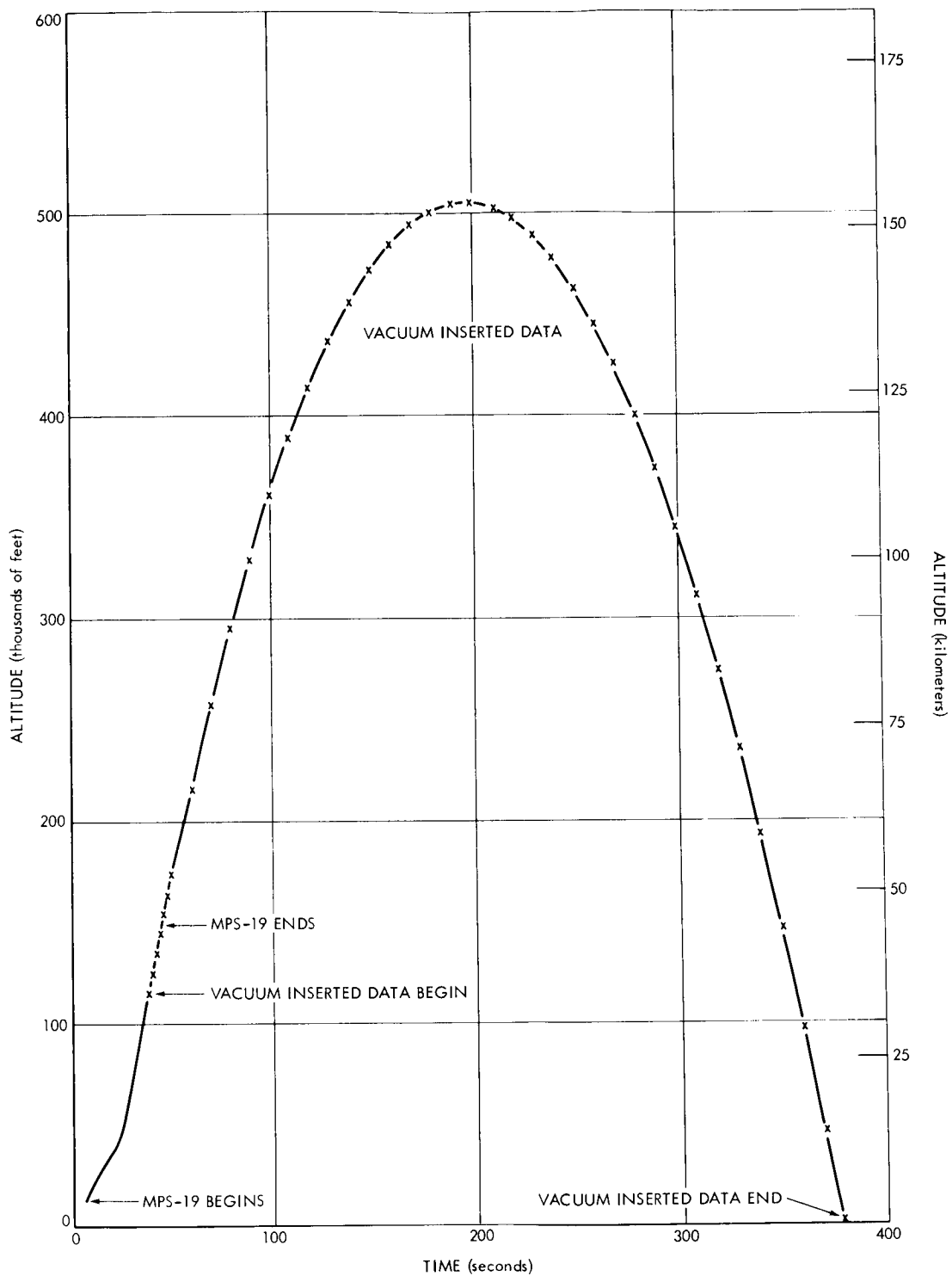


Figure 189. 14.175 GE Radar Plot, Altitude vs Time



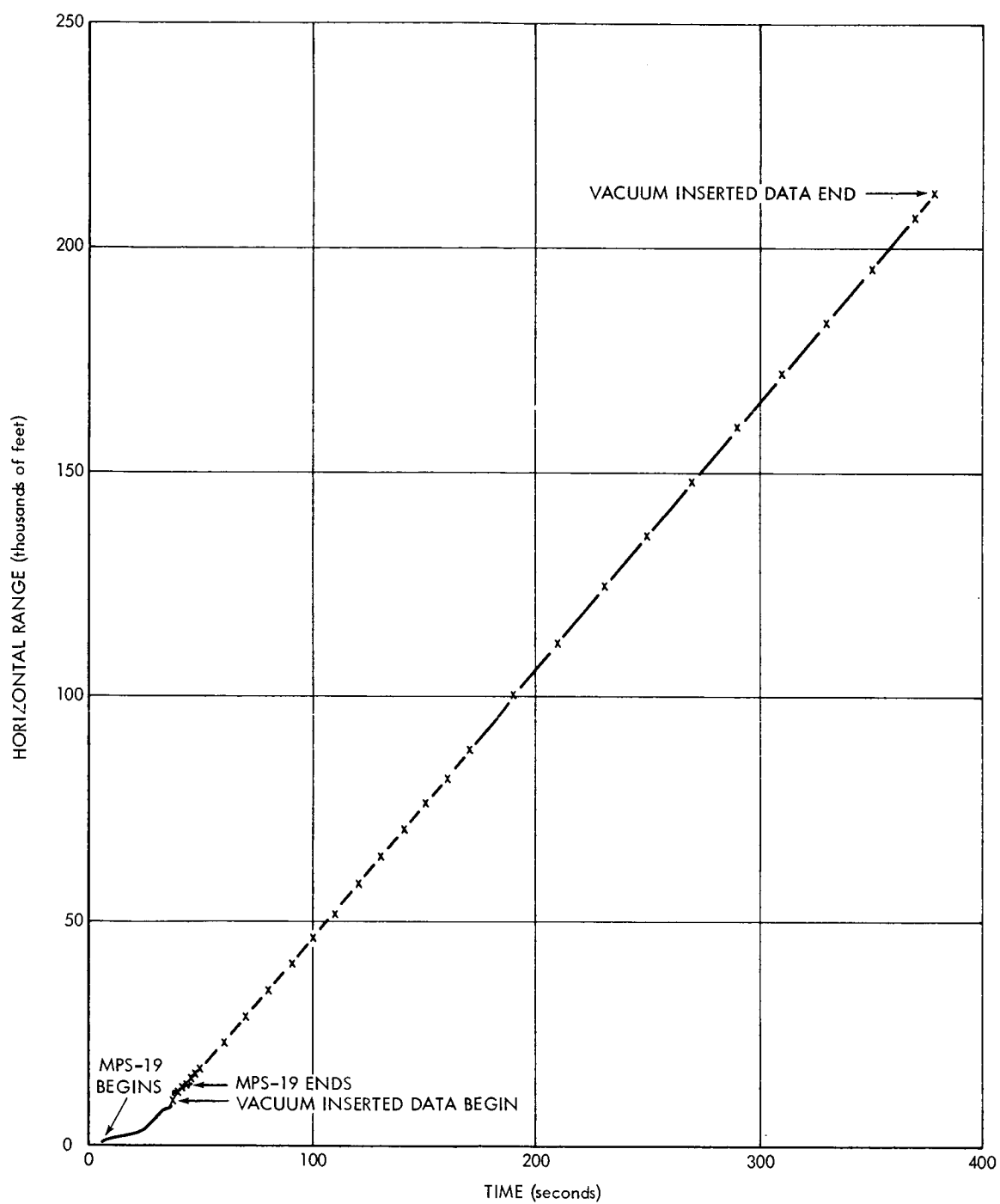


Figure 190. 14.175 GE Radar Plot, Horizontal Range vs Time

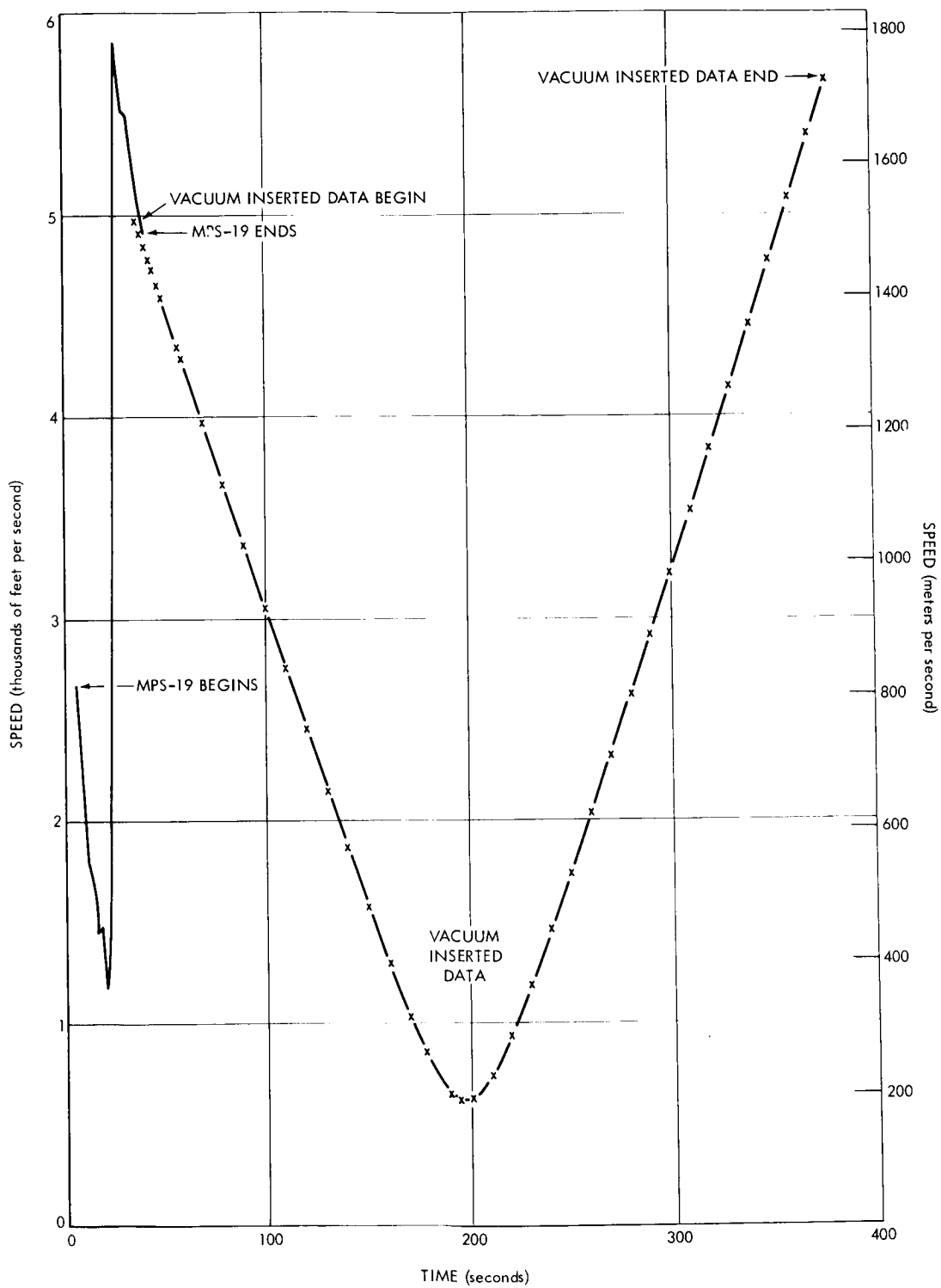


Figure 191. 14.175 GE Radar Plot, Speed vs Time

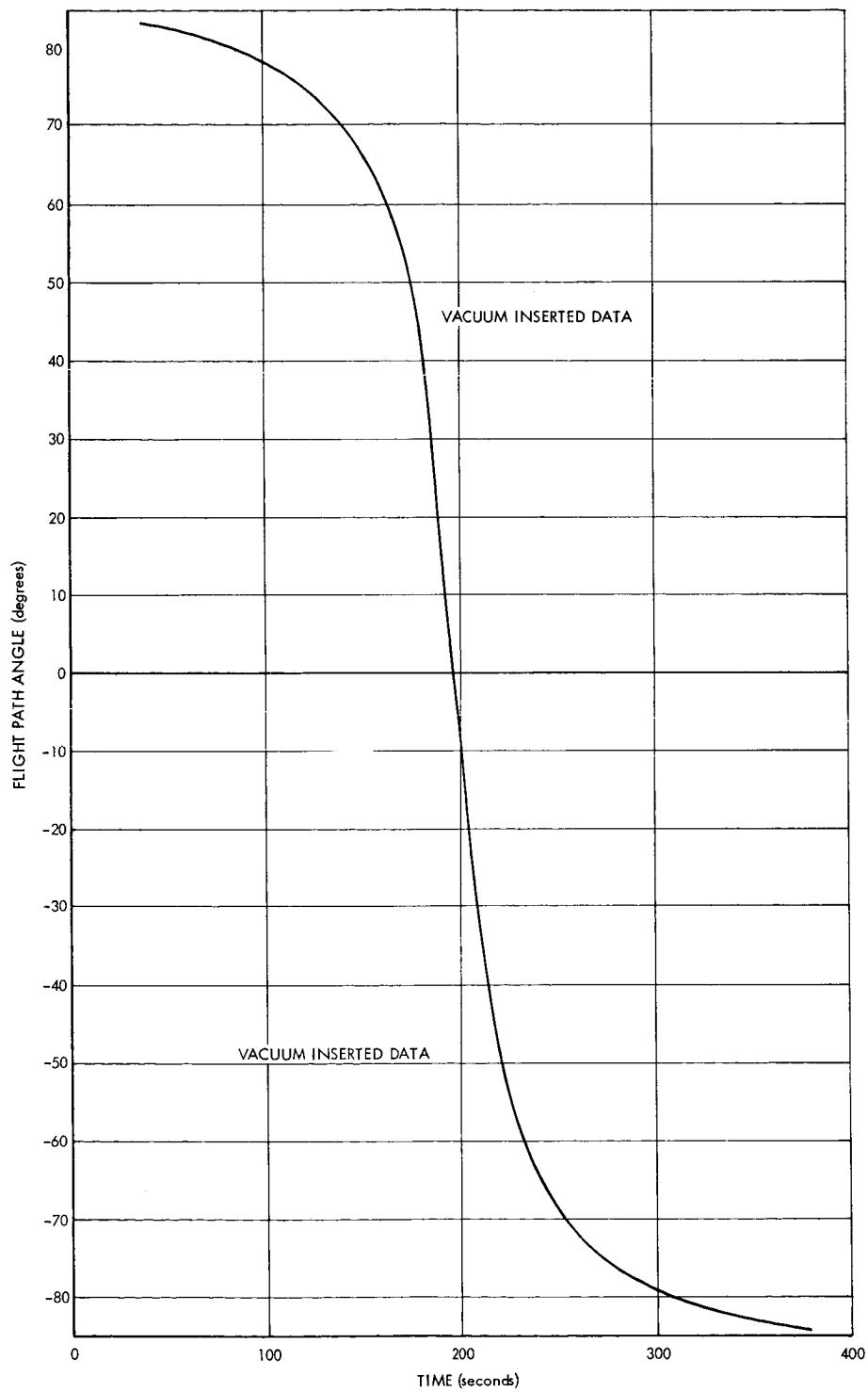


Figure 192. 14.175 GE Radar Plot, Flight Path Angle vs Time

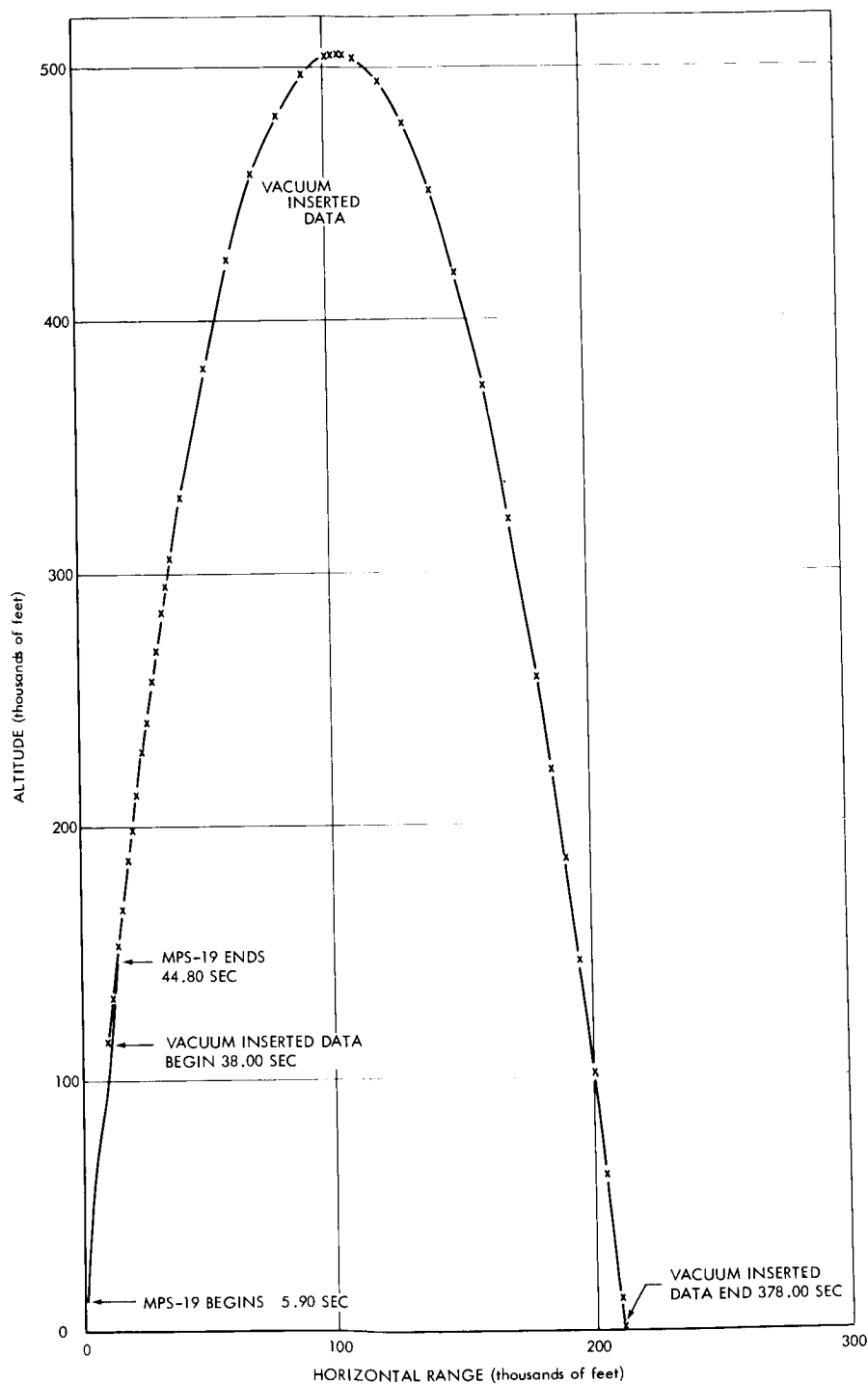


Figure 193. 14.175 GE Radar Plot, Altitude vs Horizontal Range

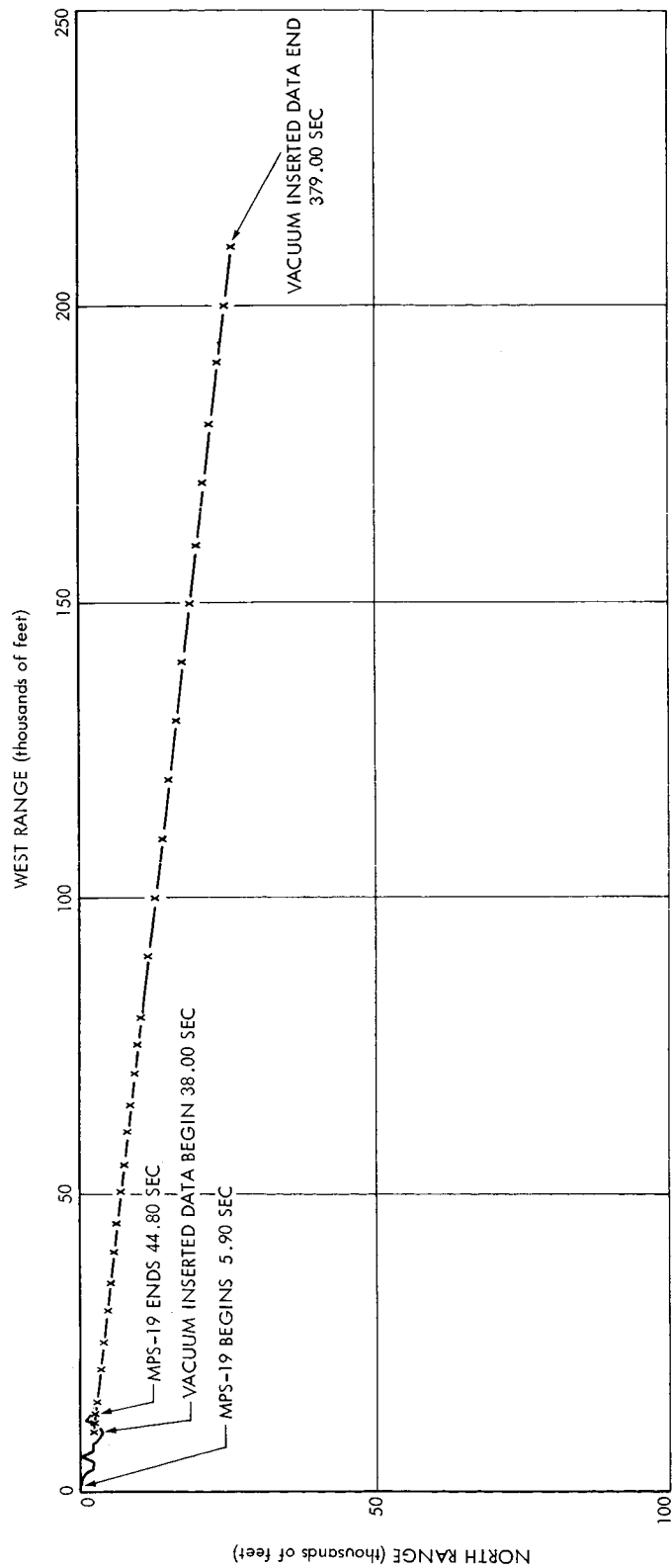


Figure 194. 14.175 GE Radar Plot, North Range vs West Range

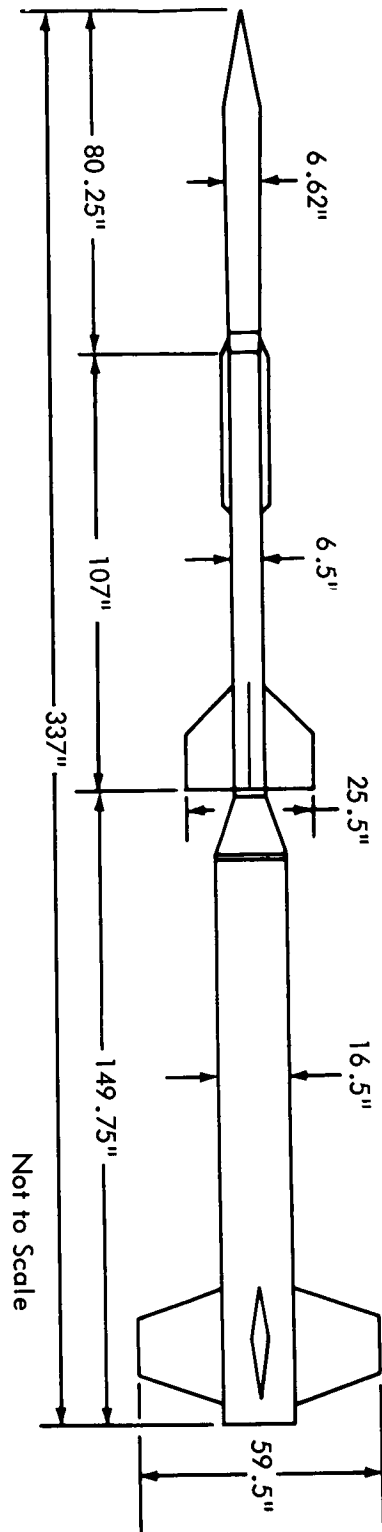


Figure 195. 14.176 GE Sketch

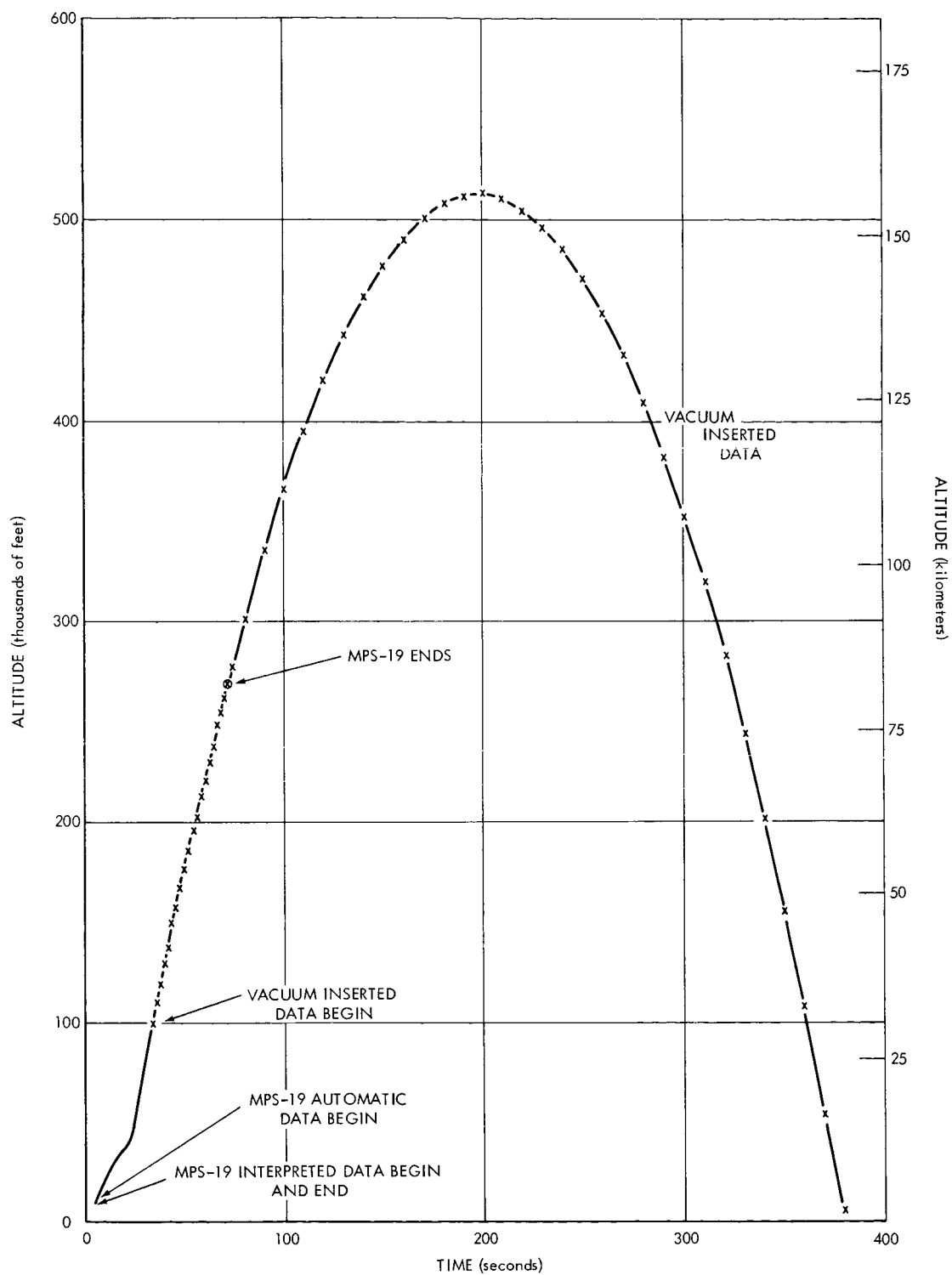


Figure 196. 14.176 GE Radar Plot, Altitude vs Time

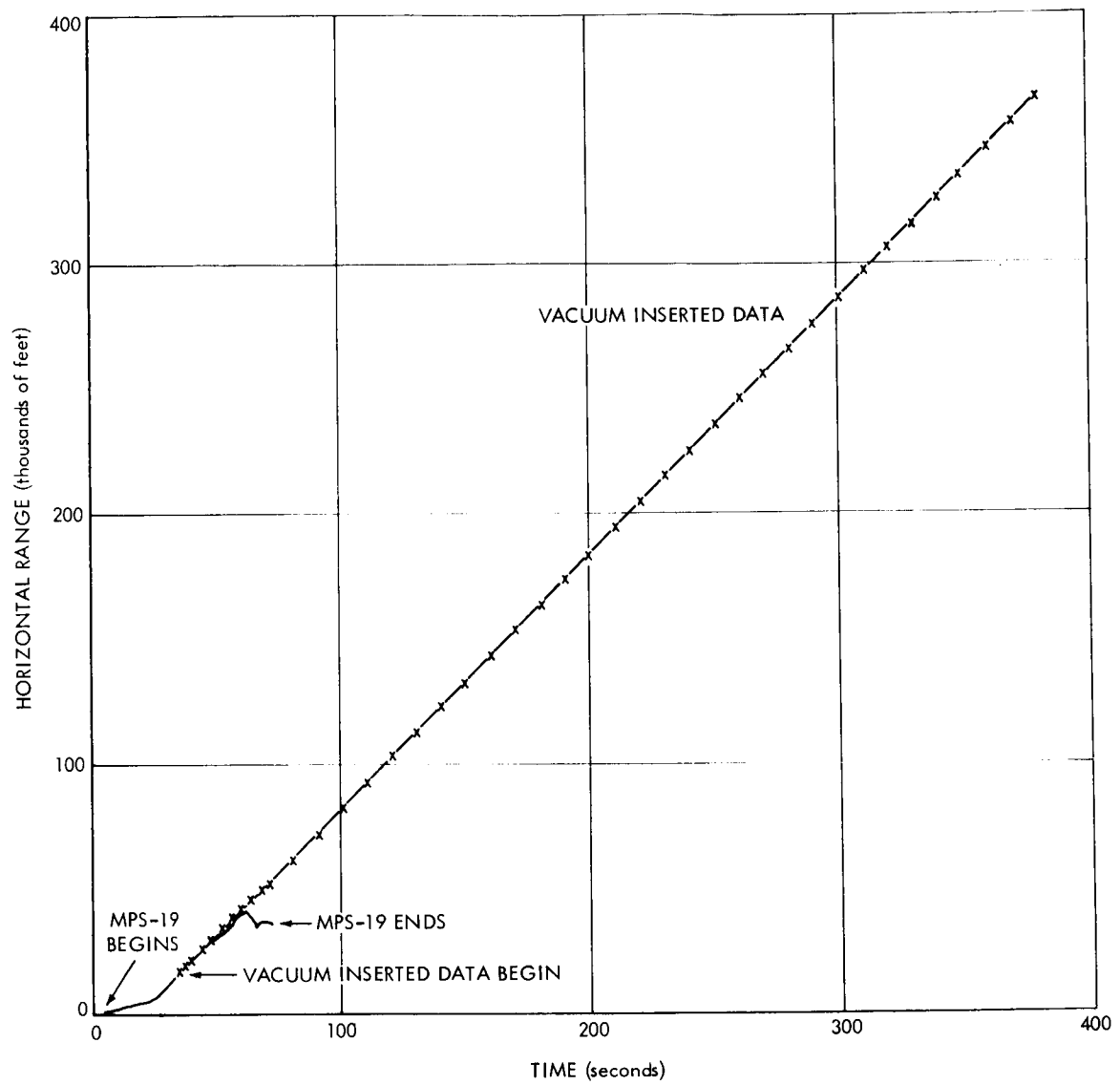


Figure 197. 14.176 GE Radar Plot, Horizontal Range vs Time



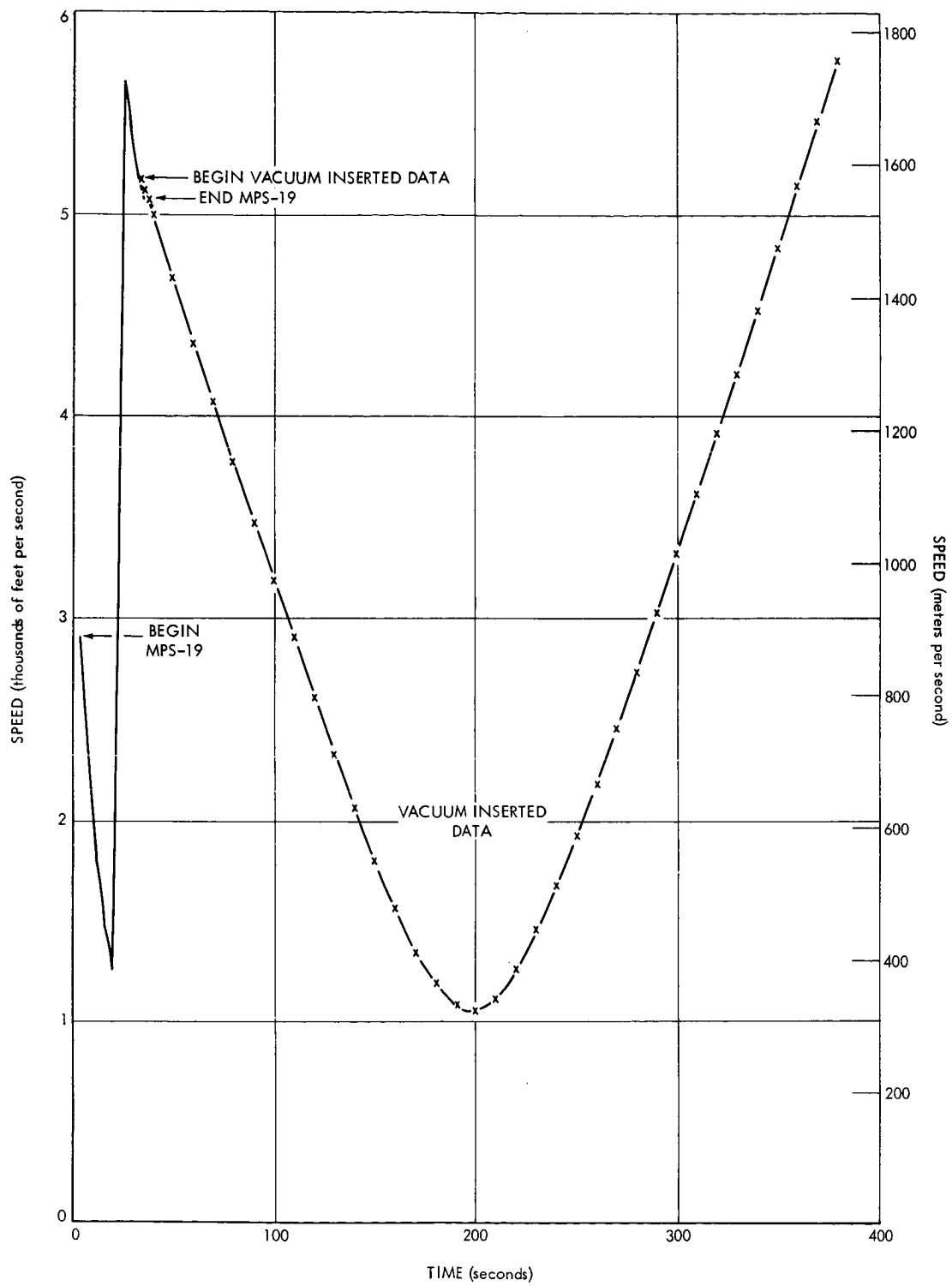


Figure 198. 14.176 GE Radar Plot, Speed vs Time

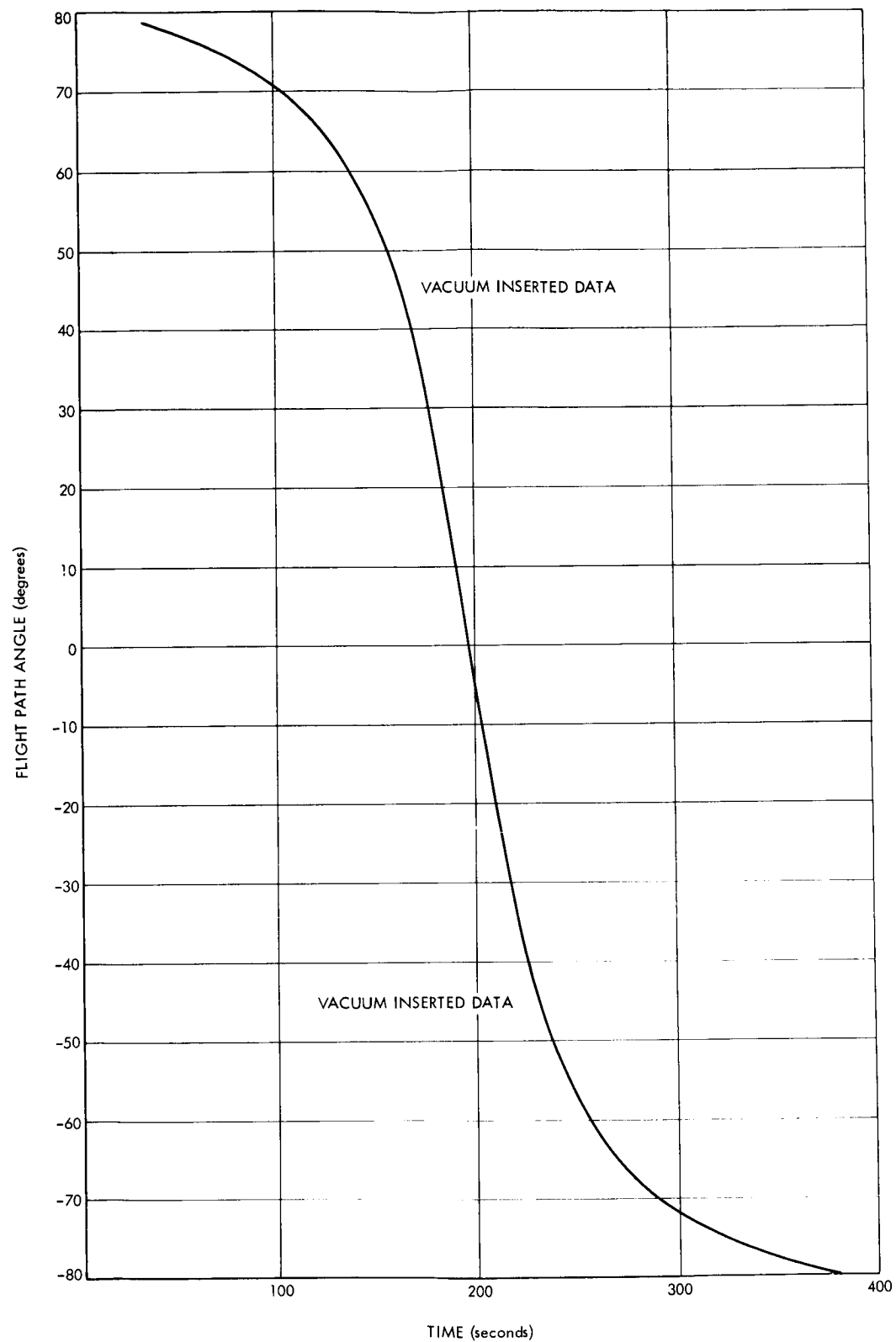


Figure 199. 14.176 GE Radar Plot, Flight Path Angle vs Time

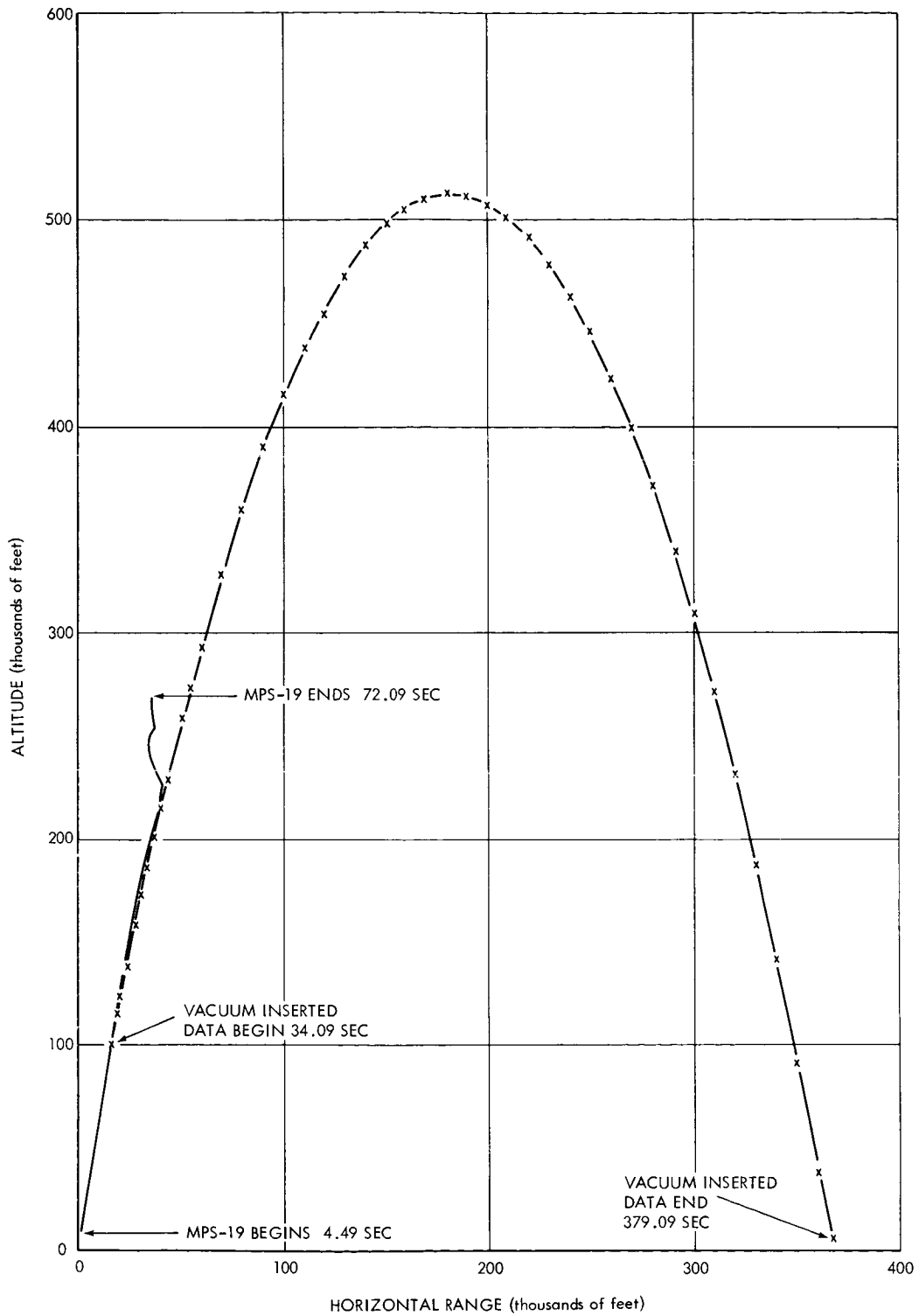


Figure 200. 14.176 GE Radar Plot, Altitude vs Horizontal Range

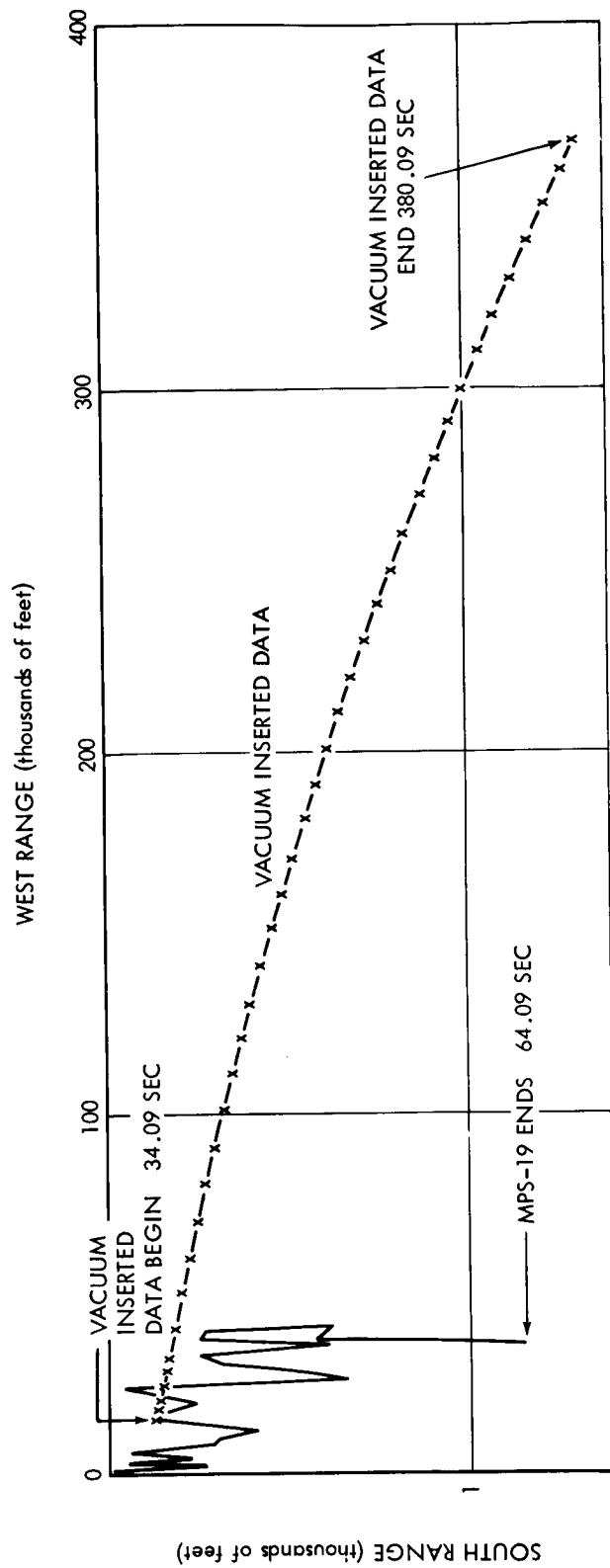


Figure 201. 14.176 GE Radar Plot, South Range vs West Range

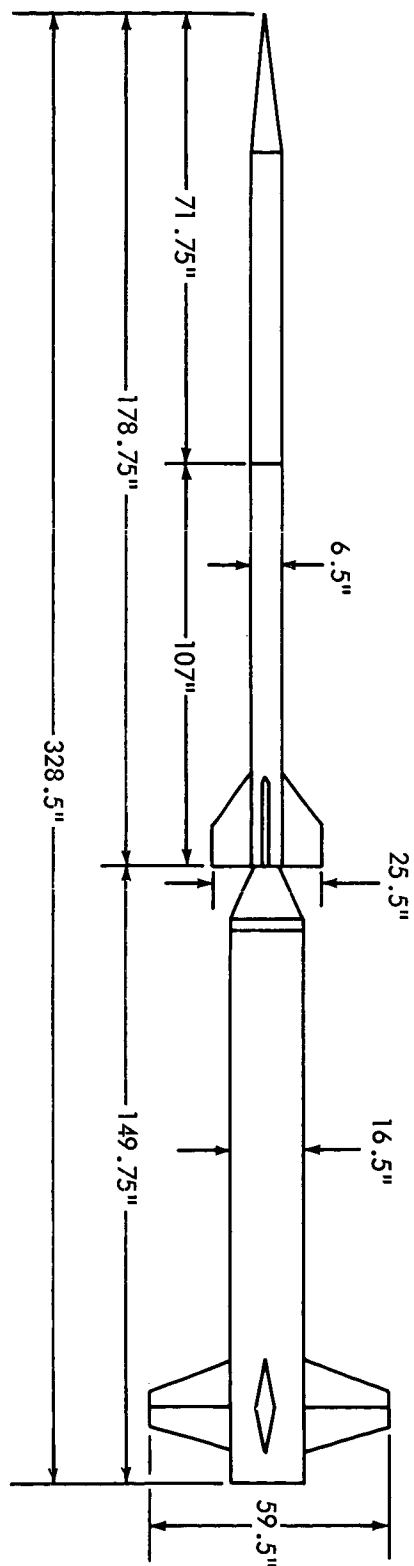


Figure 202. 14.177 GI Sketch

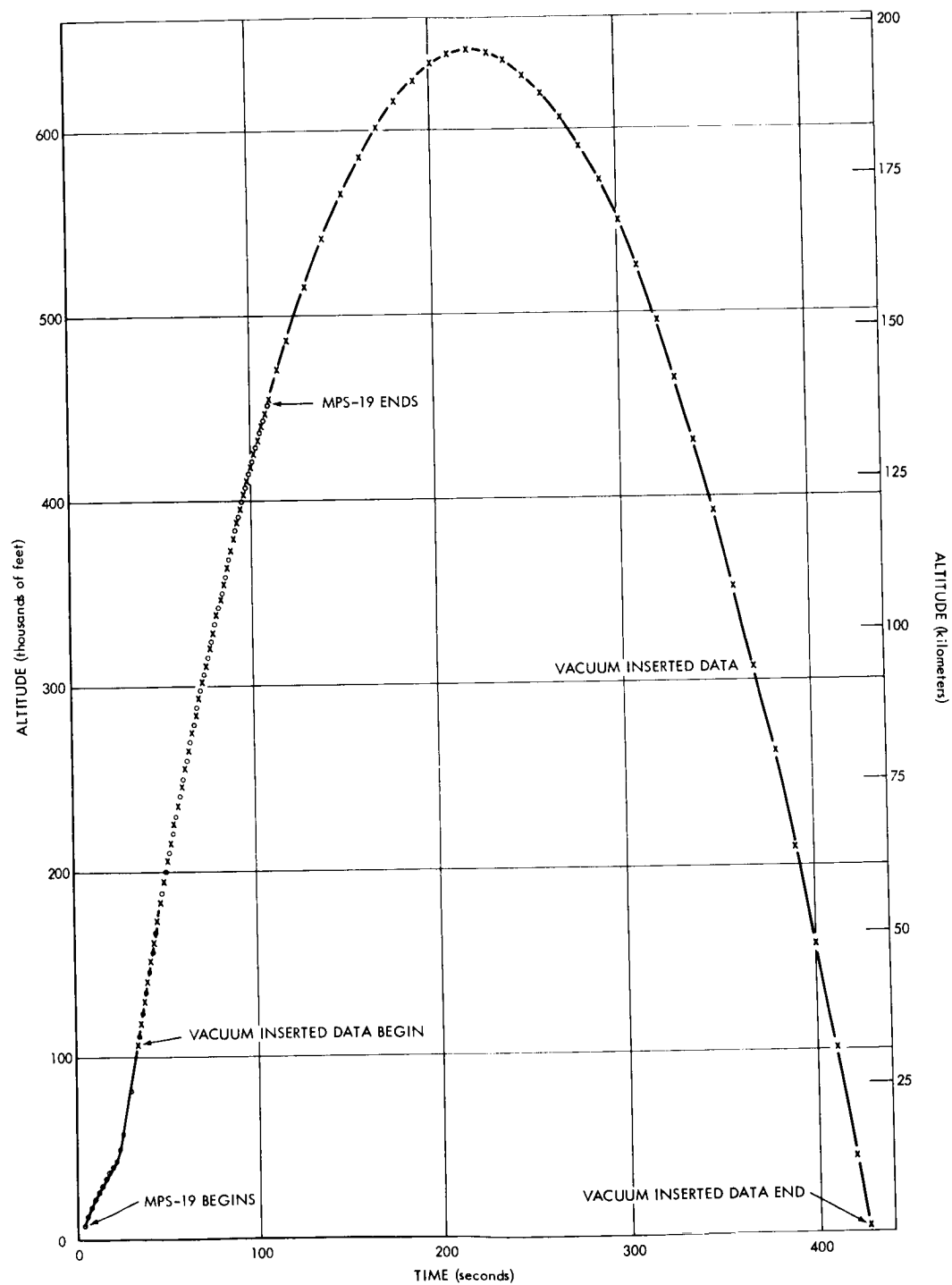


Figure 203. 14.177 GI Radar Plot, Altitude vs Time

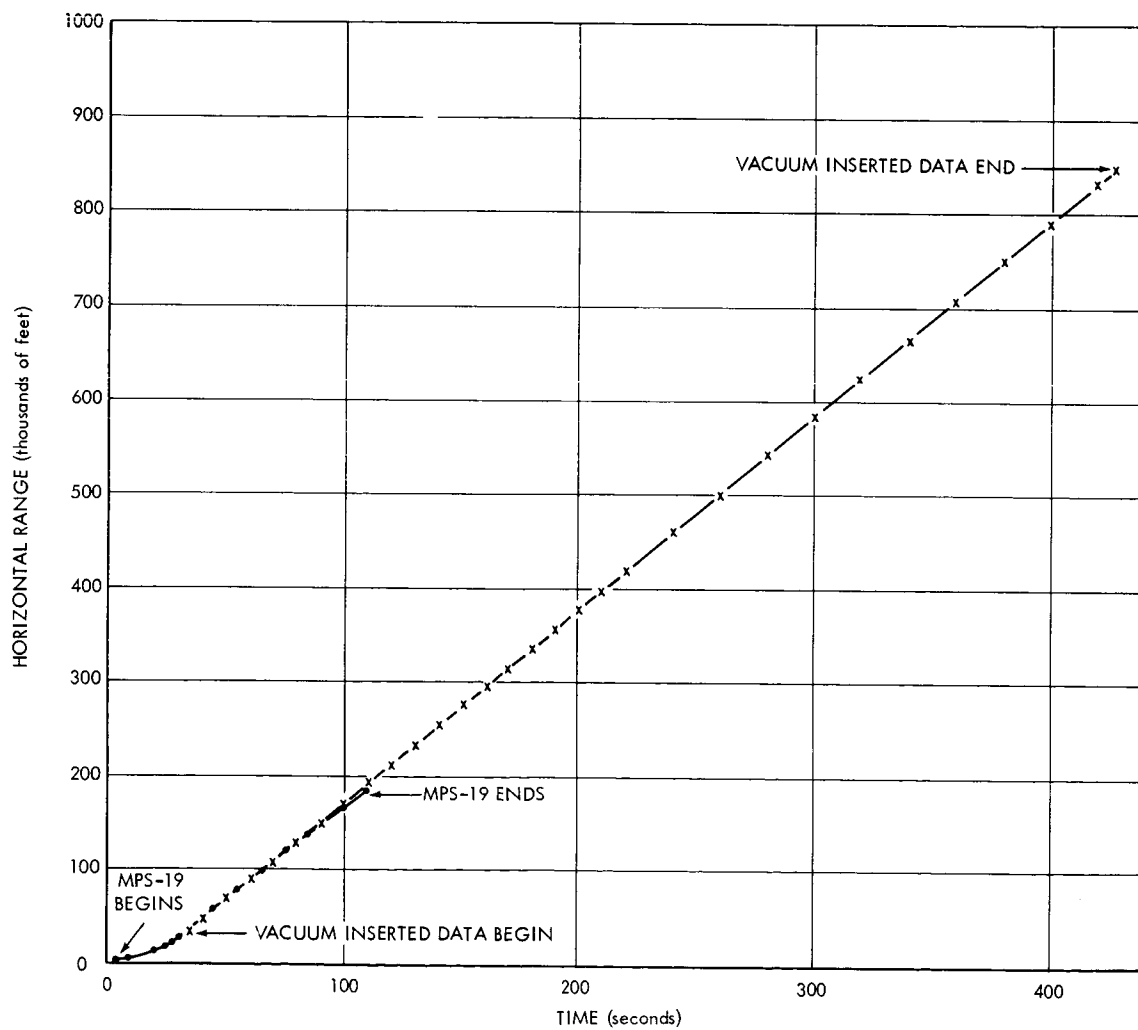


Figure 204. 14.177 GI Radar Plot, Horizontal Range vs Time

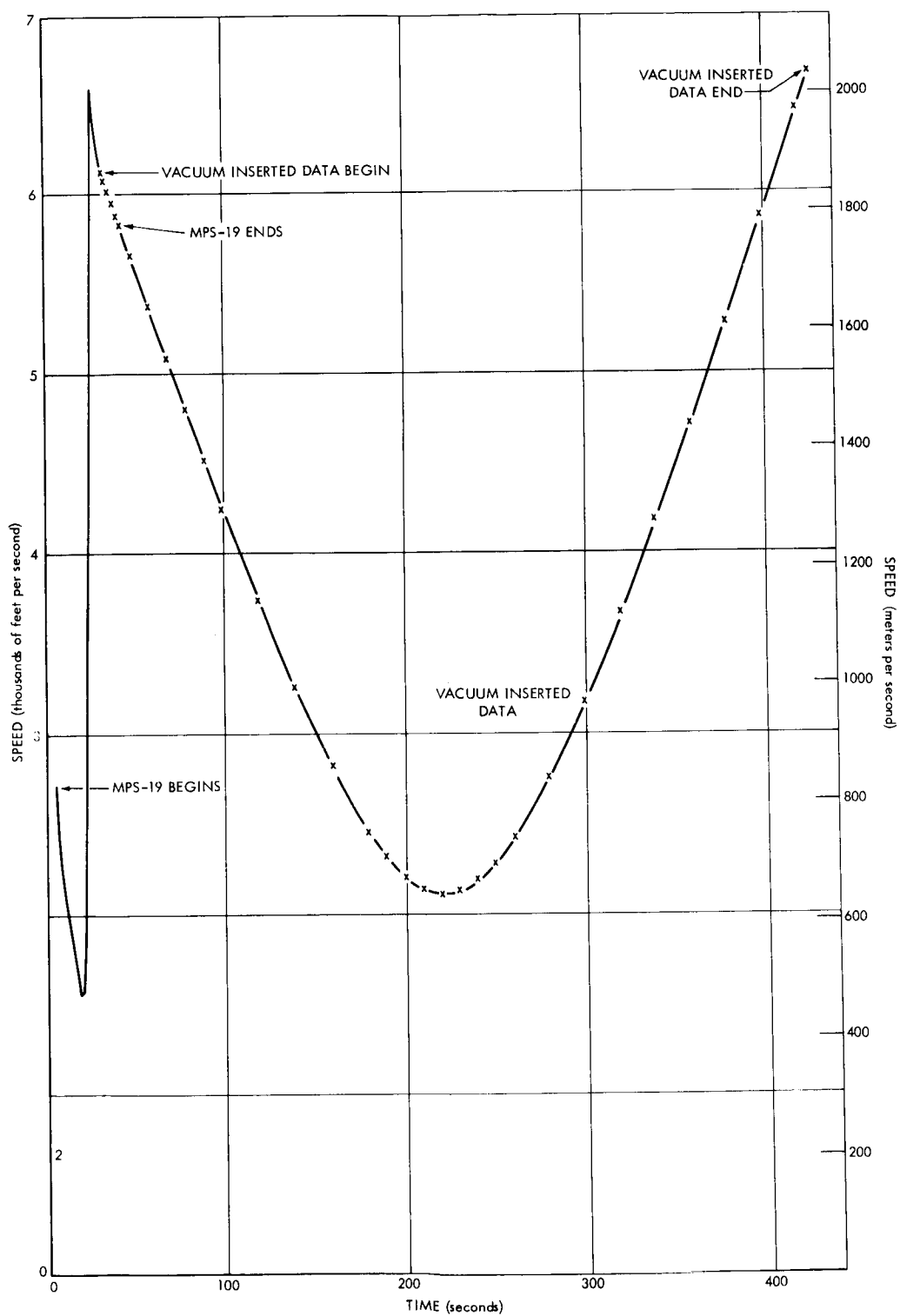


Figure 205. 14.177 GI Radar Plot, Speed vs Time



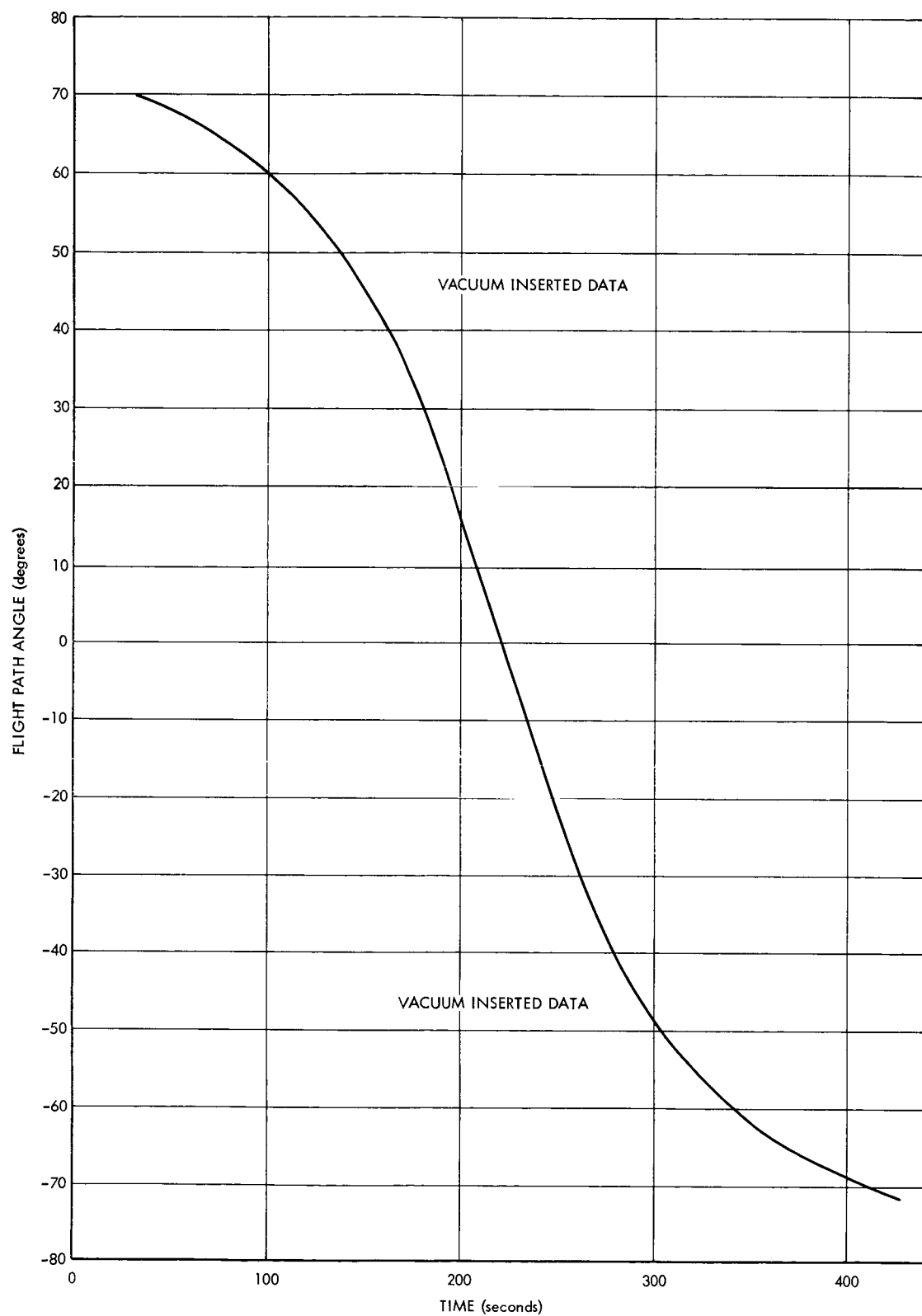


Figure 206. 14.177 GI Radar Plot, Flight Path Angle vs Time

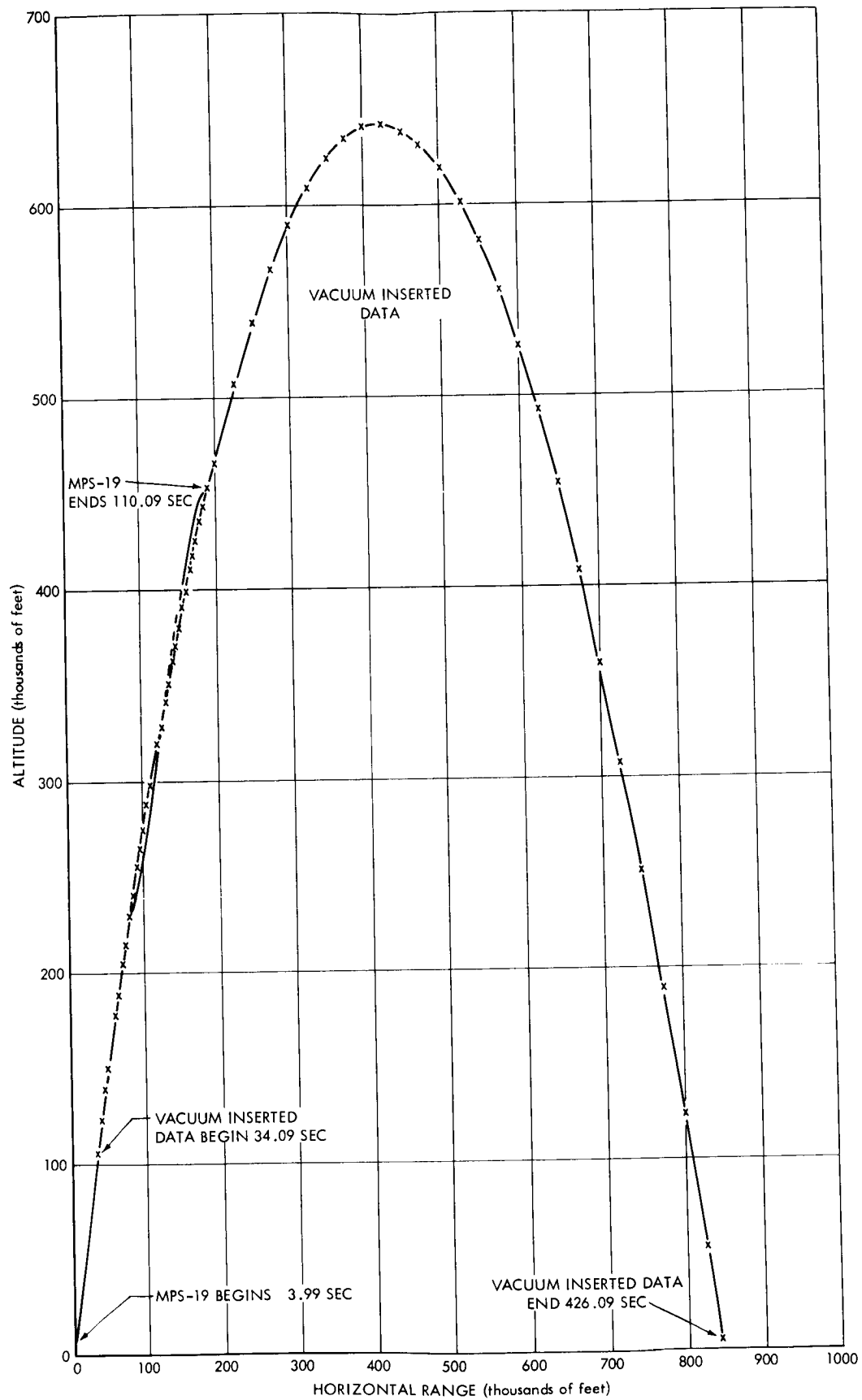


Figure 207. 14.177 GI Radar Plot, Altitude vs Horizontal Range

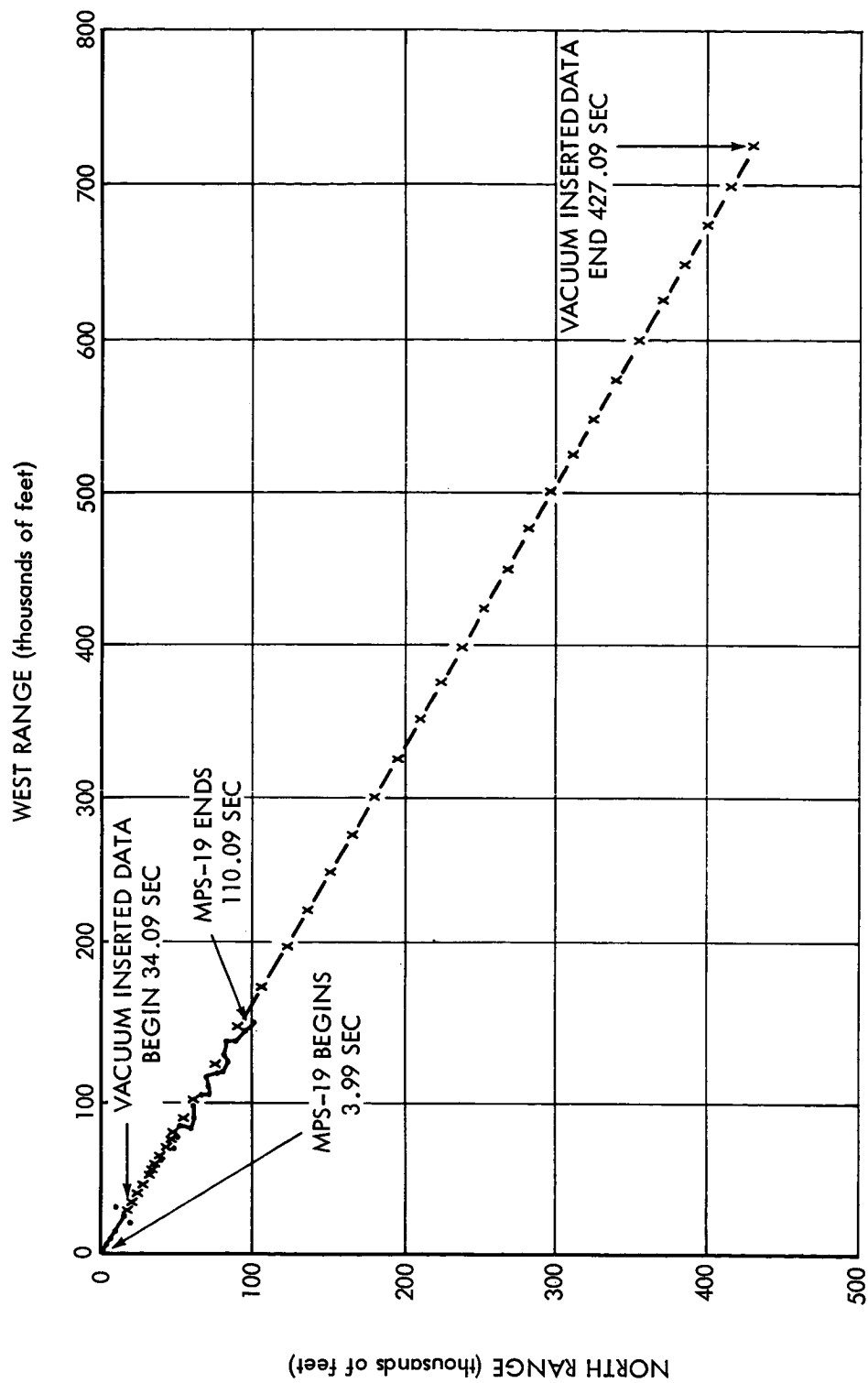


Figure 208. 14.177 GI Radar Plot, North Range vs West Range

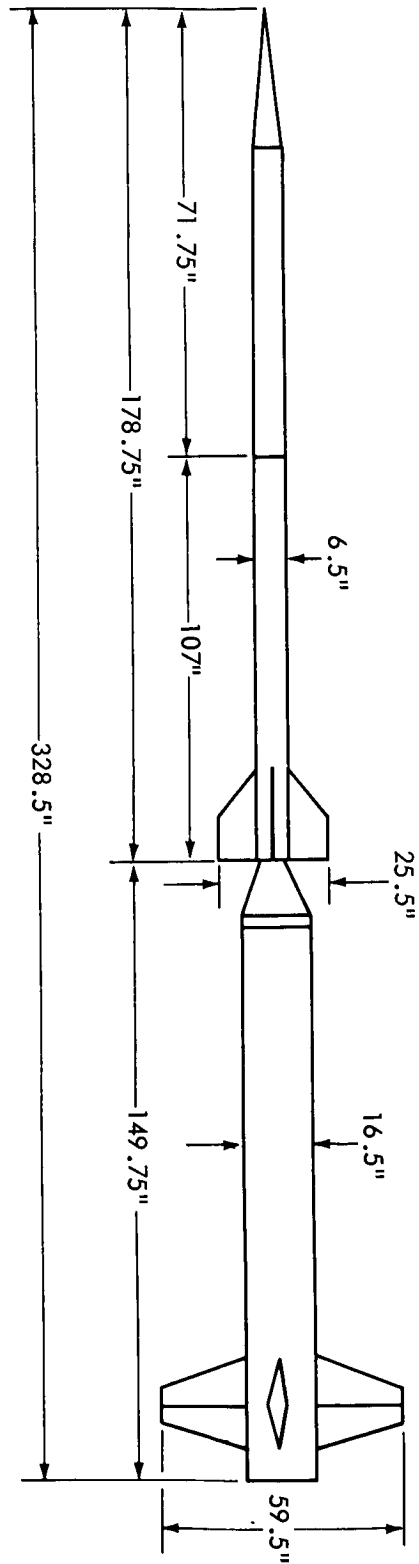


Figure 209. 14.178 GI Sketch

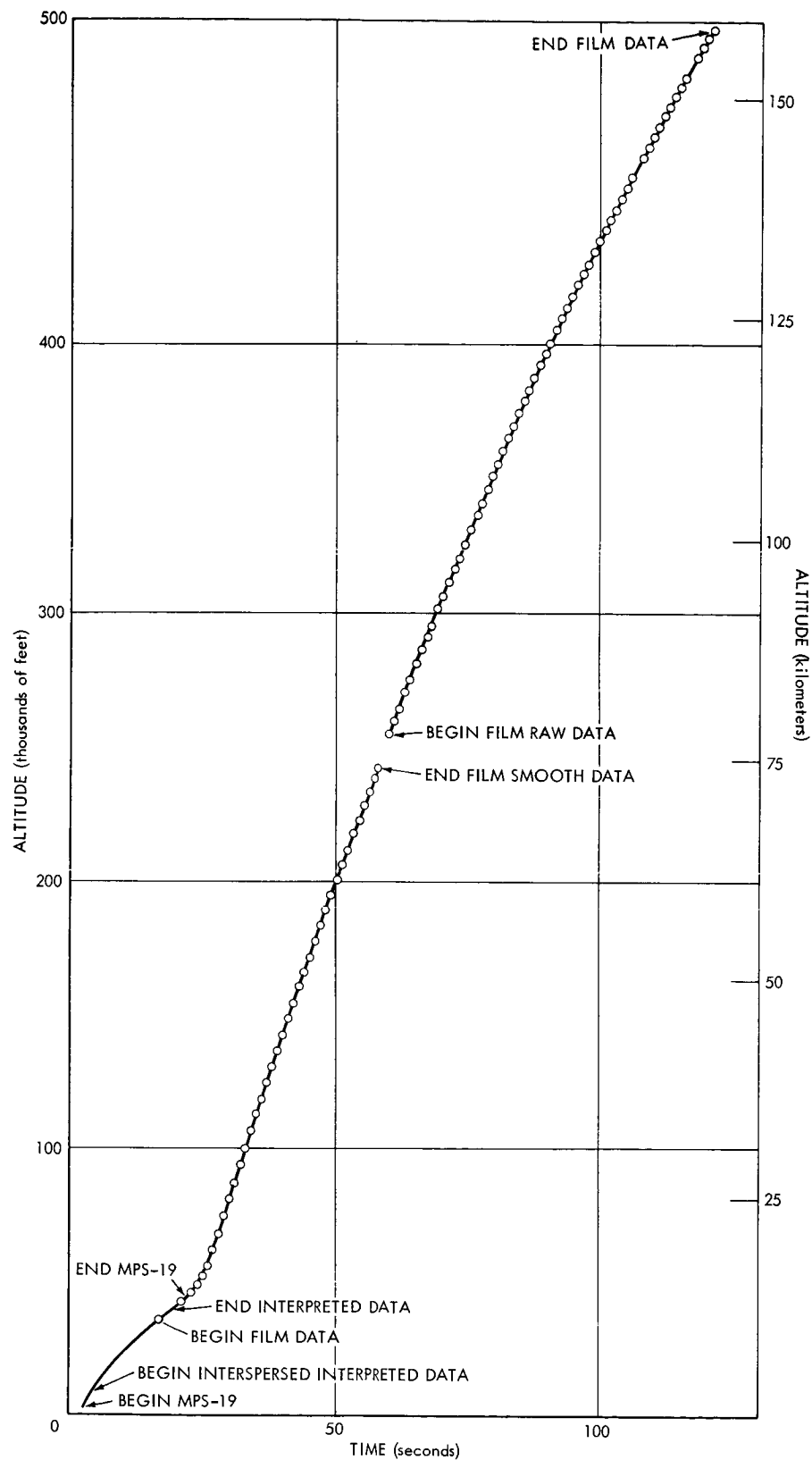


Figure 210. 14.178 GI Radar Plot, Altitude vs Time

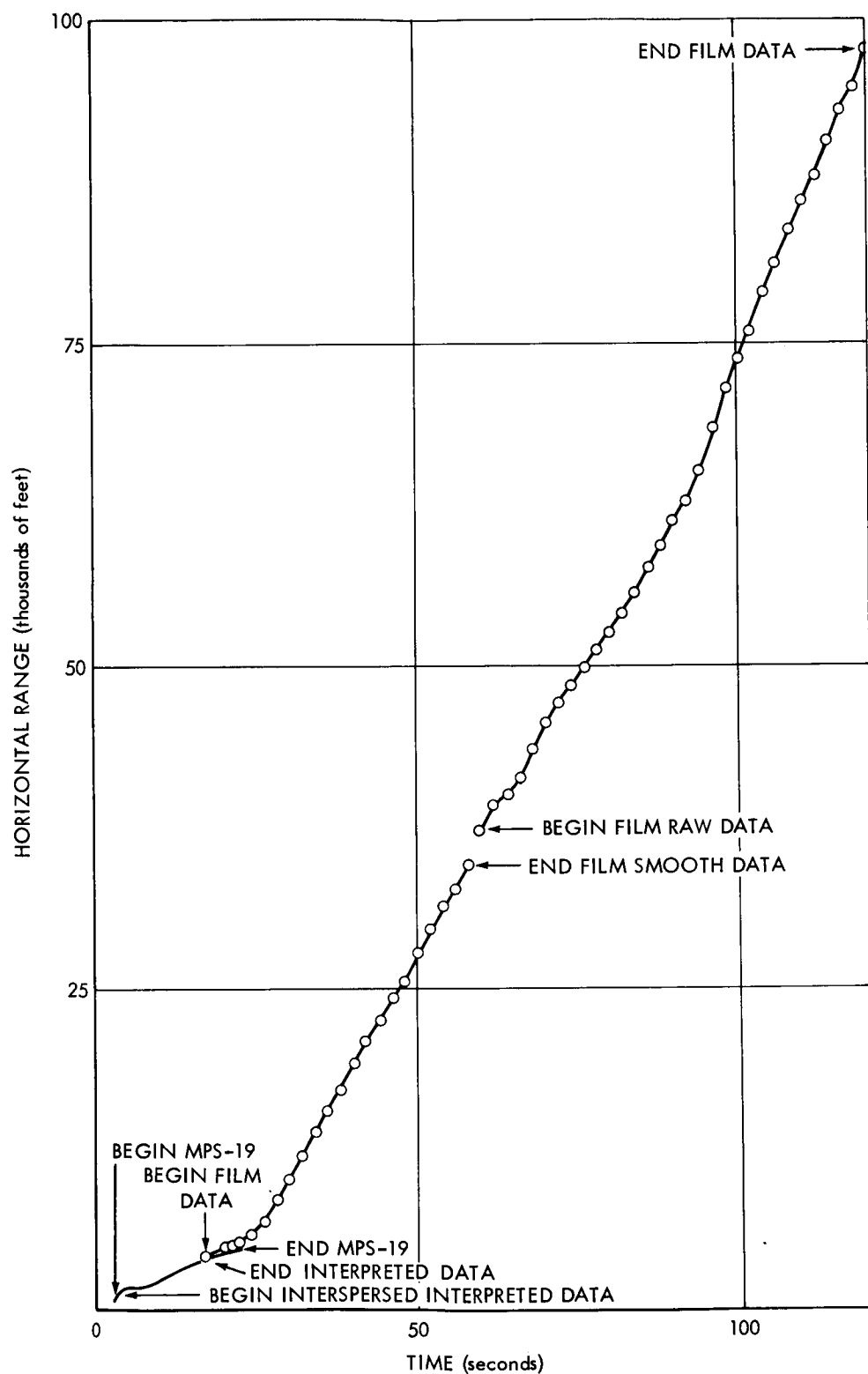


Figure 211. 14.178 GI Radar Plot, Horizontal Range vs Time

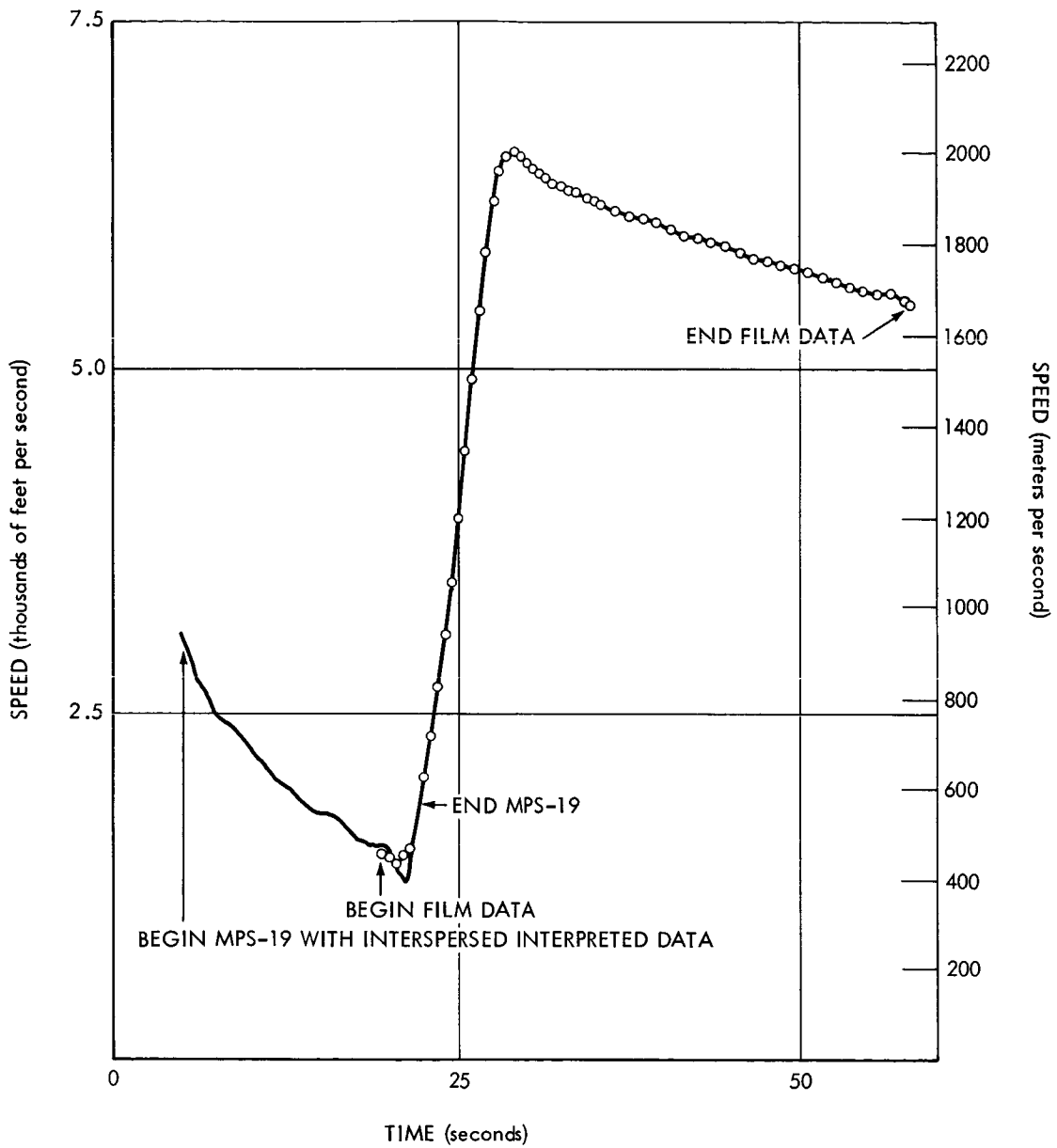


Figure 212. 14.178 GI Radar Plot, Speed vs Time

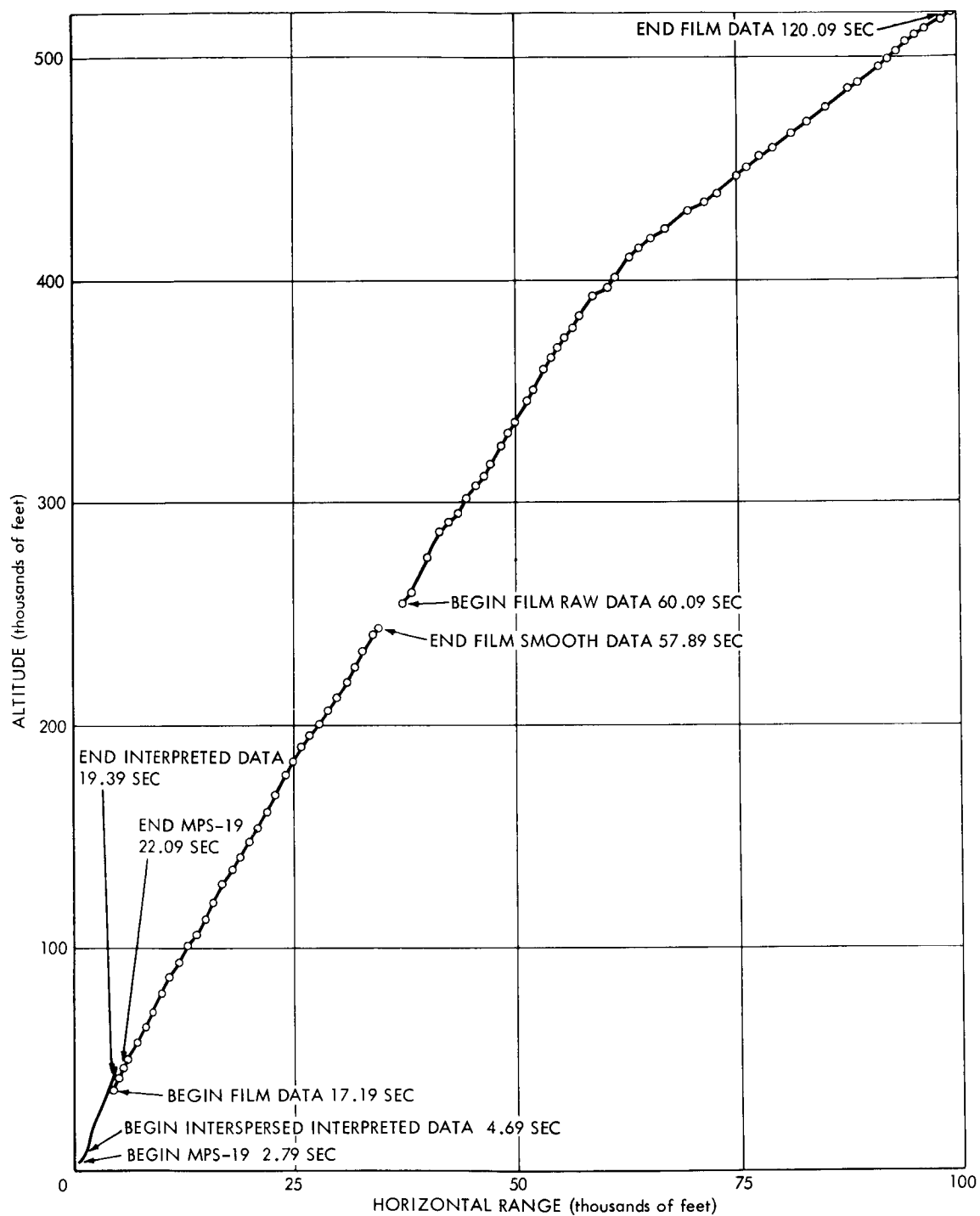


Figure 213. 14.178 GI Radar Plot, Altitude vs Horizontal Range



NORTH (thousands of feet)

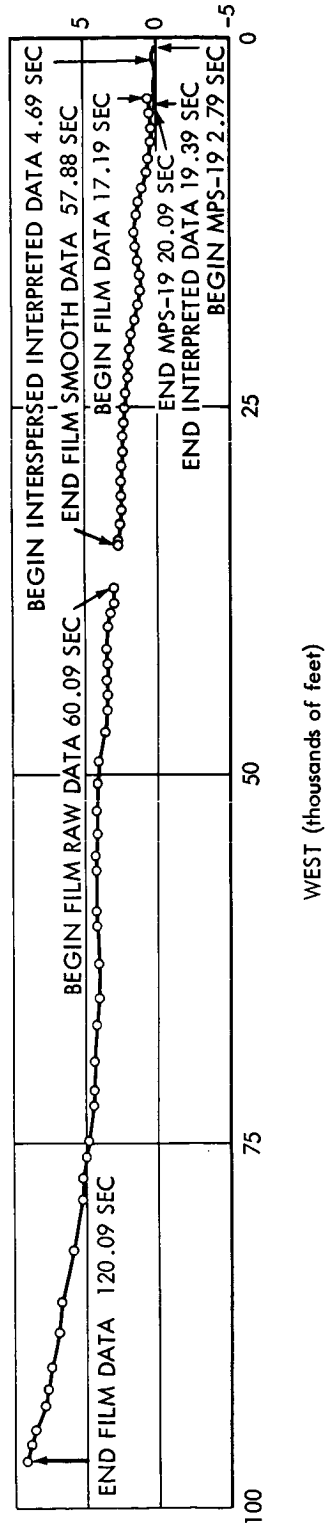


Figure 214. 14.178 GI Radar Plot, North Range vs West Range

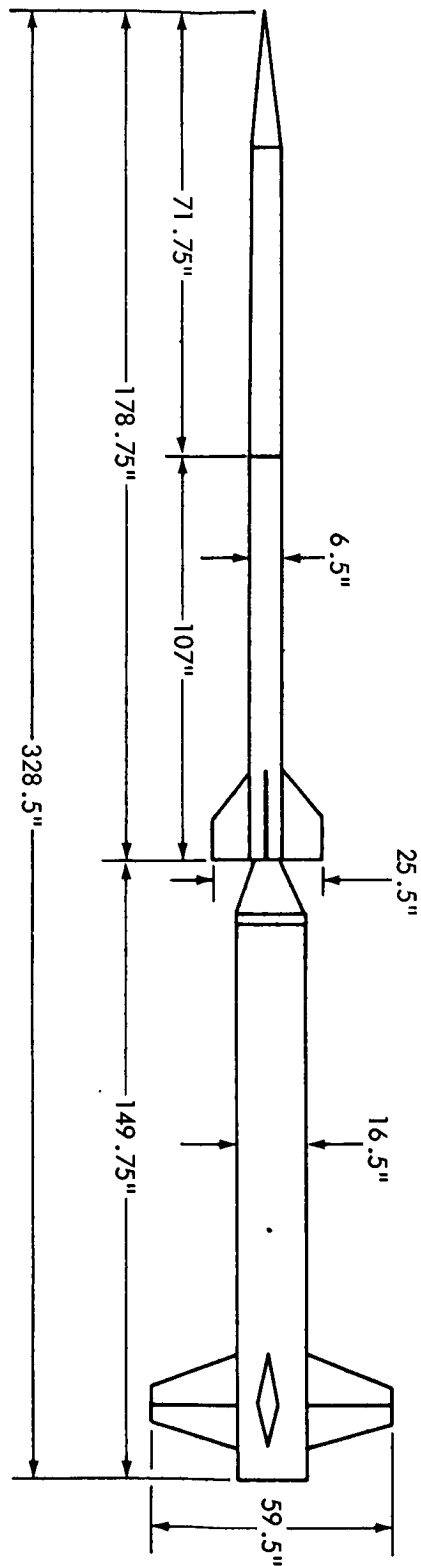


Figure 215. 14.179 GI Sketch

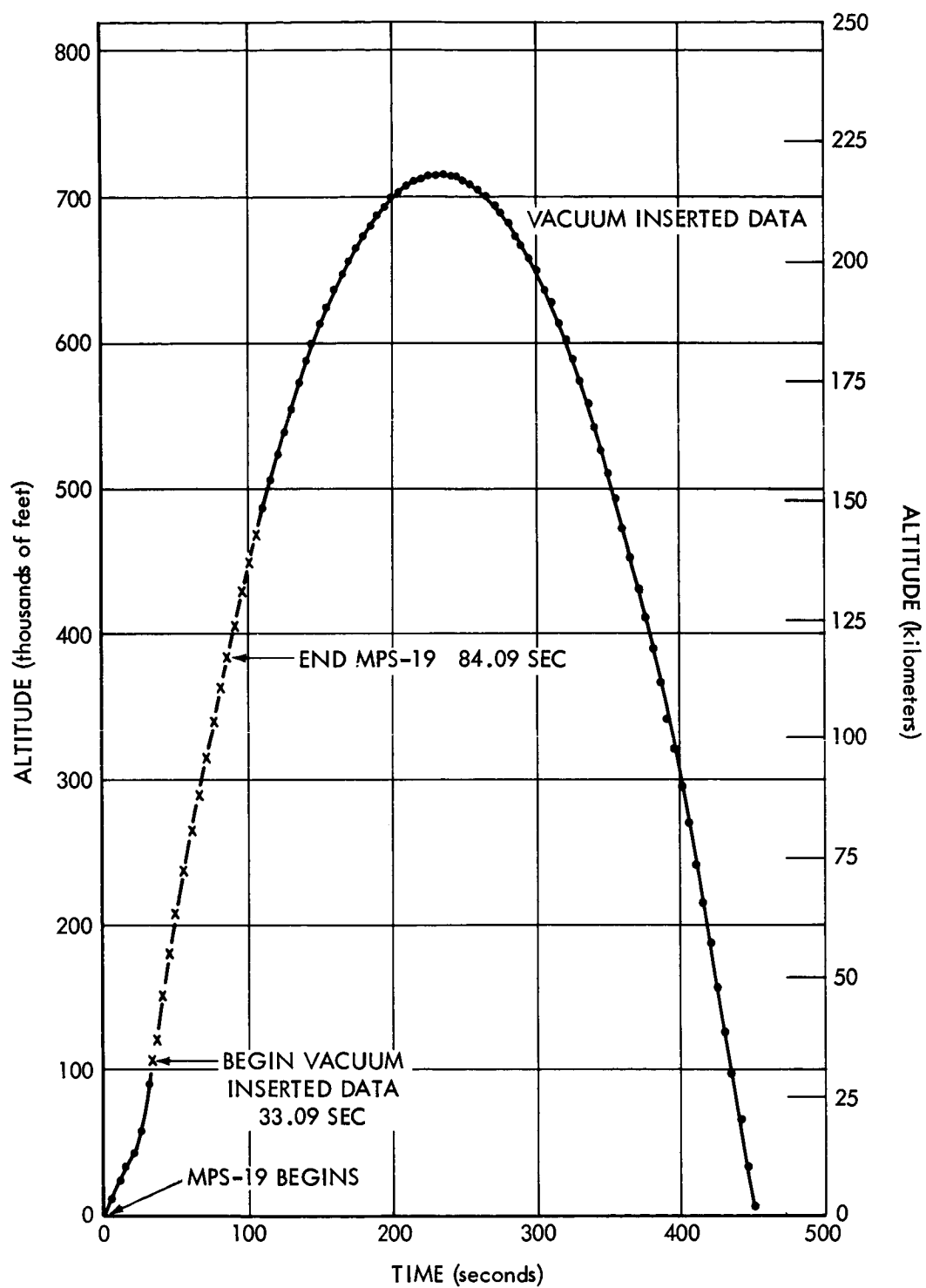


Figure 216. 14.179 GI Radar Plot, Altitude vs Time

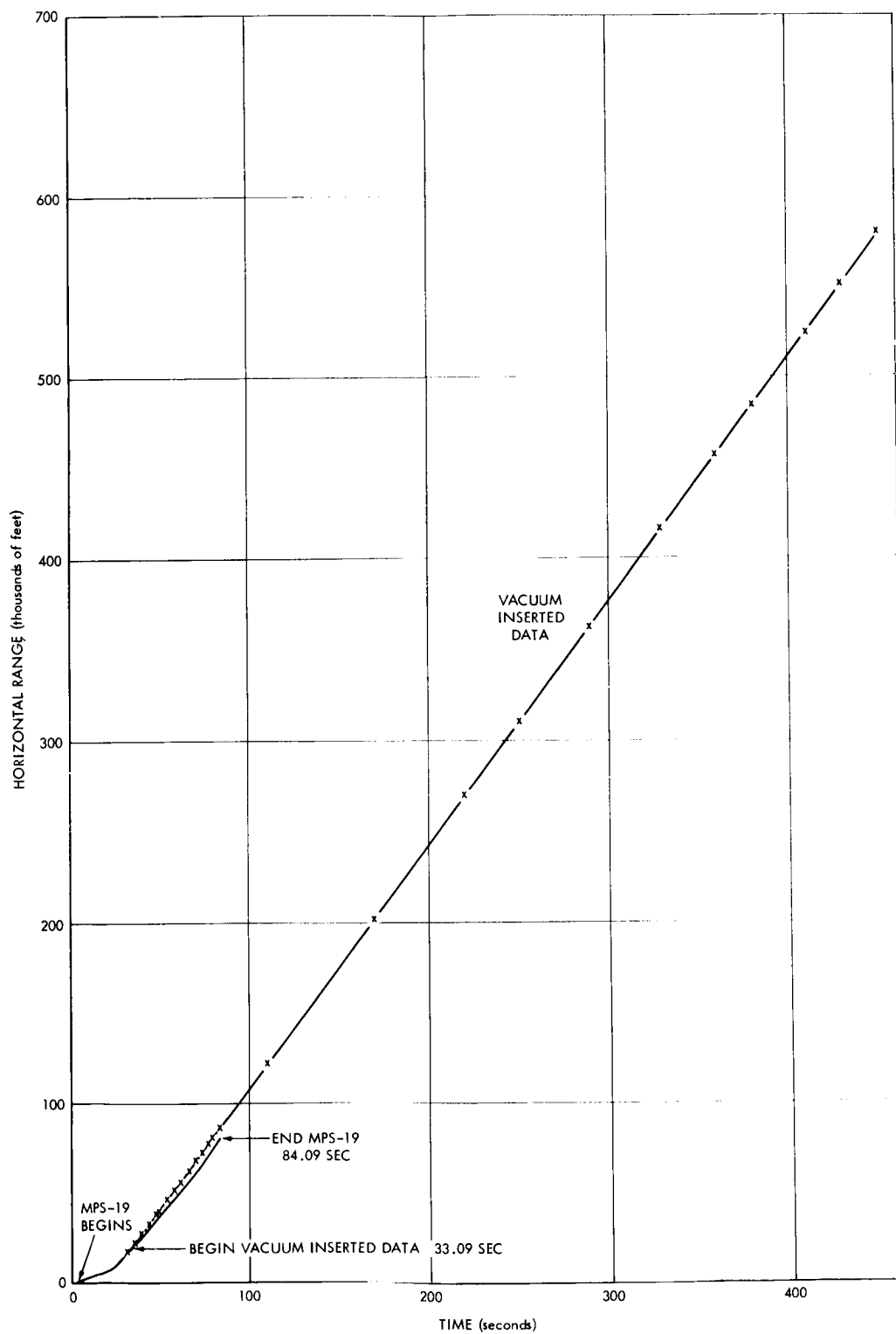


Figure 217. 14.179 GI Radar Plot, Horizontal Range vs Time

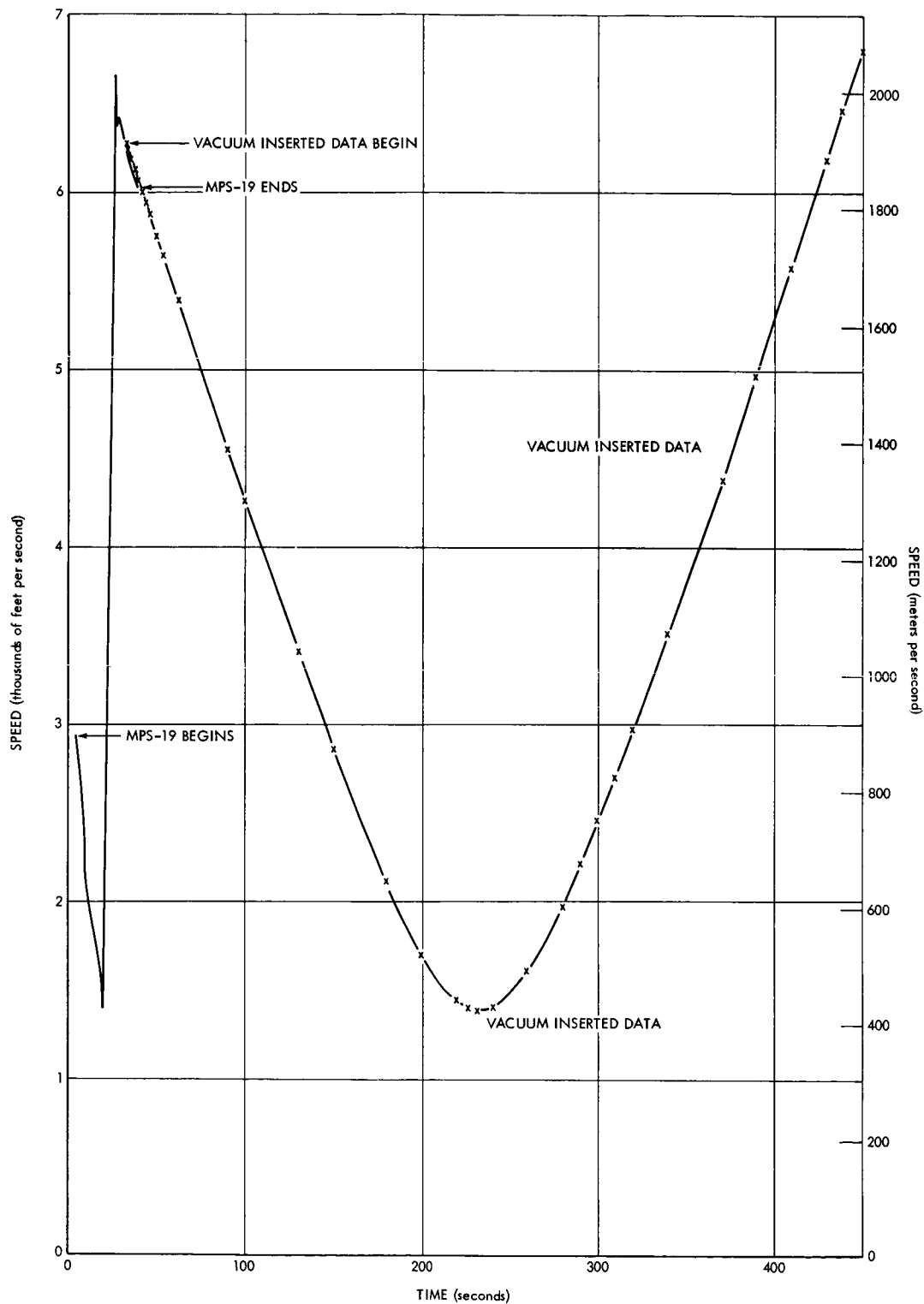


Figure 218. 14.179 GI Radar Plot, Speed vs Time

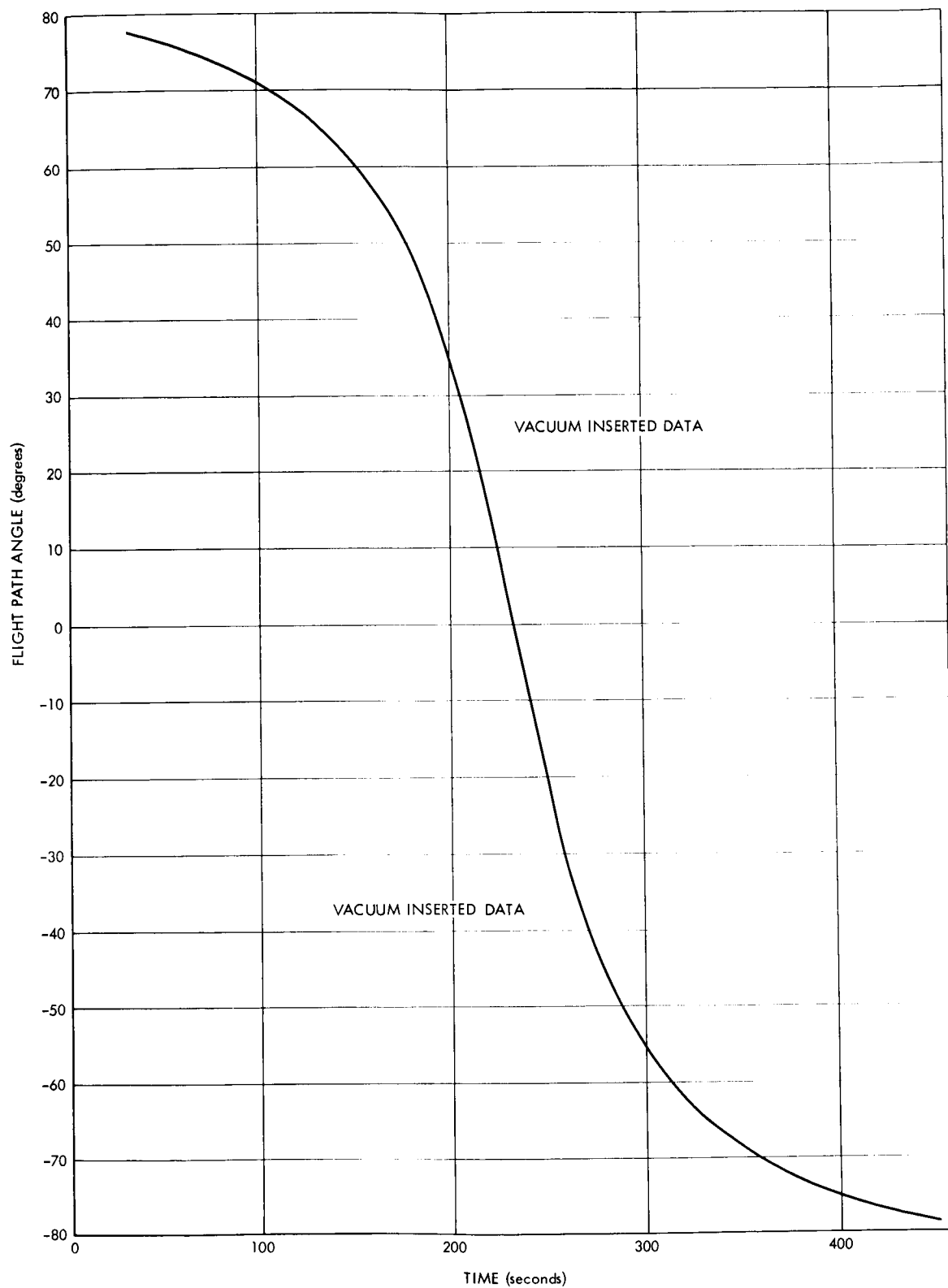


Figure 219. 14.179 GI Radar Plot, Flight Path Angle vs Time

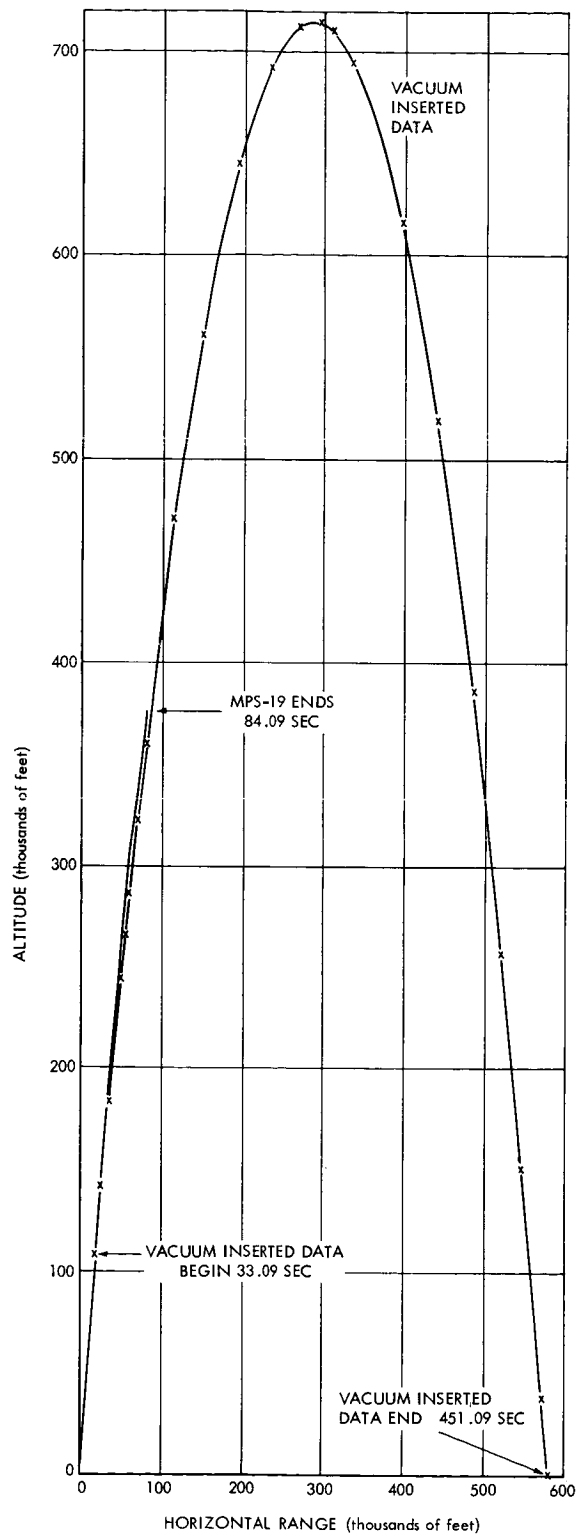


Figure 220. 14.179 GI Radar Plot, Altitude vs Horizontal Range

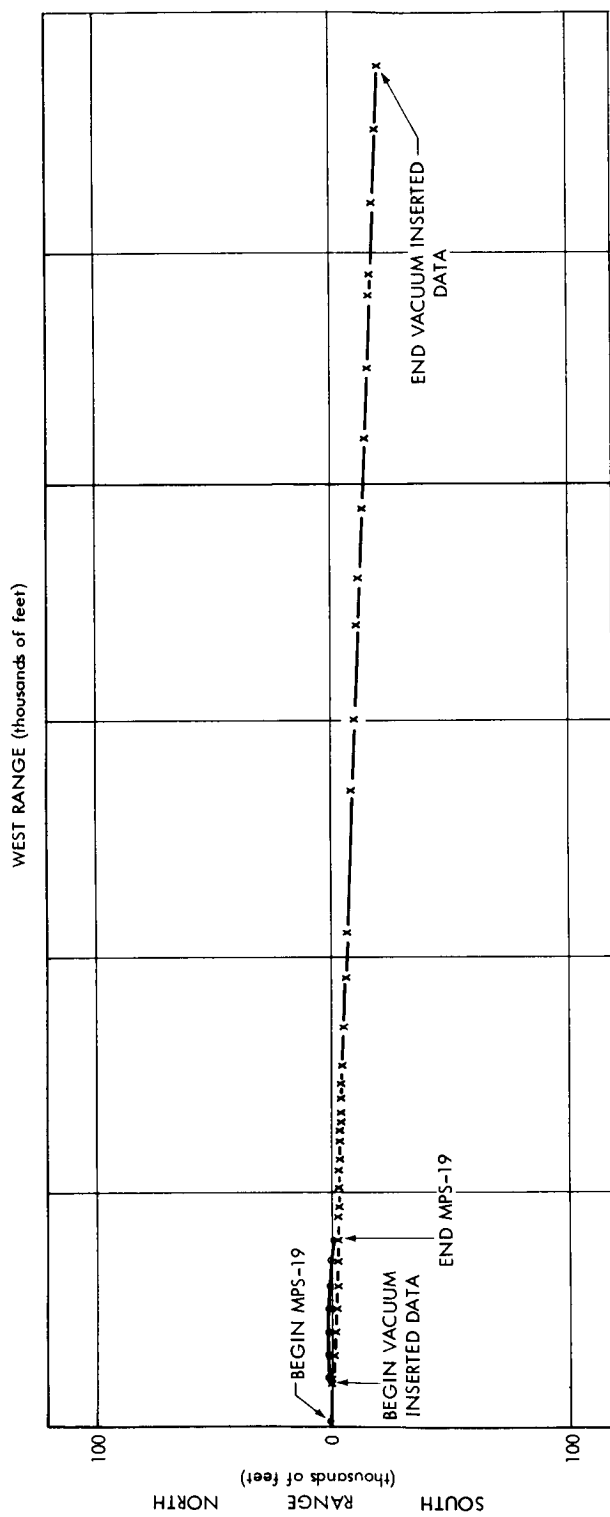


Figure 221. 14.179 GI Radar Plot, North-South Range vs West Range



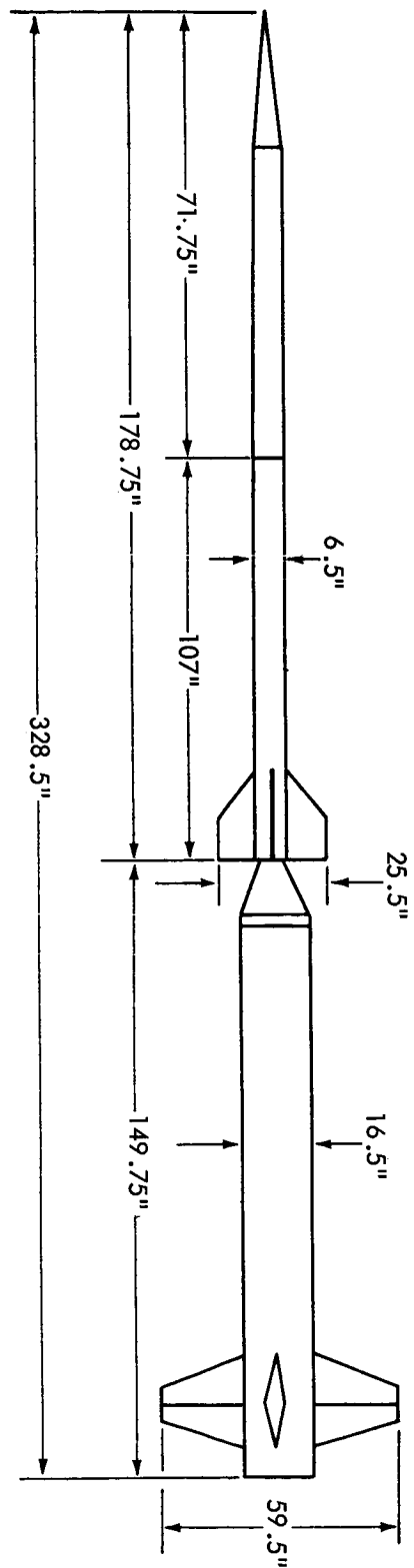


Figure 222. 14.180 GI Sketch

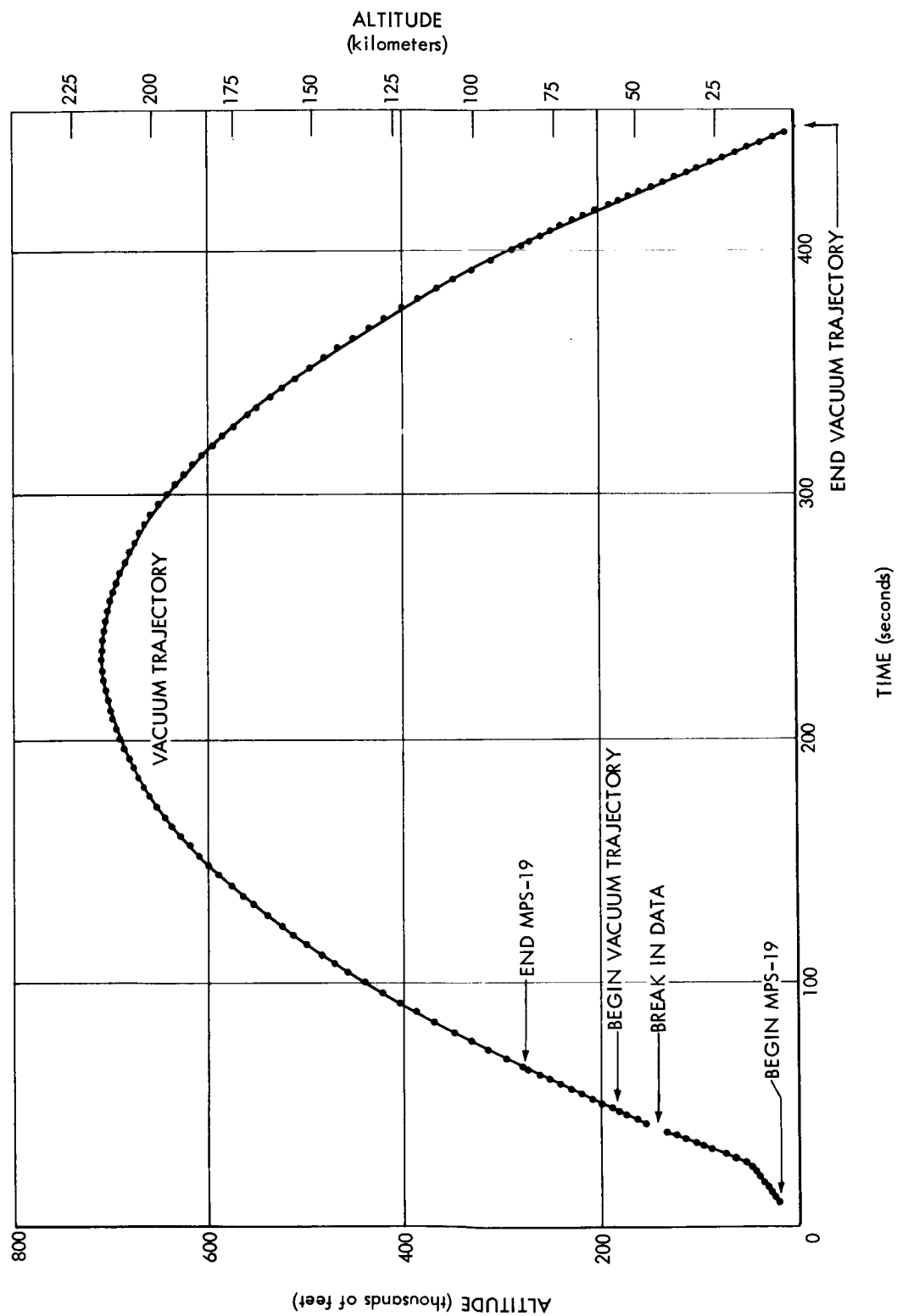


Figure 223. 14.180 GI Radar Plot, Altitude vs Time

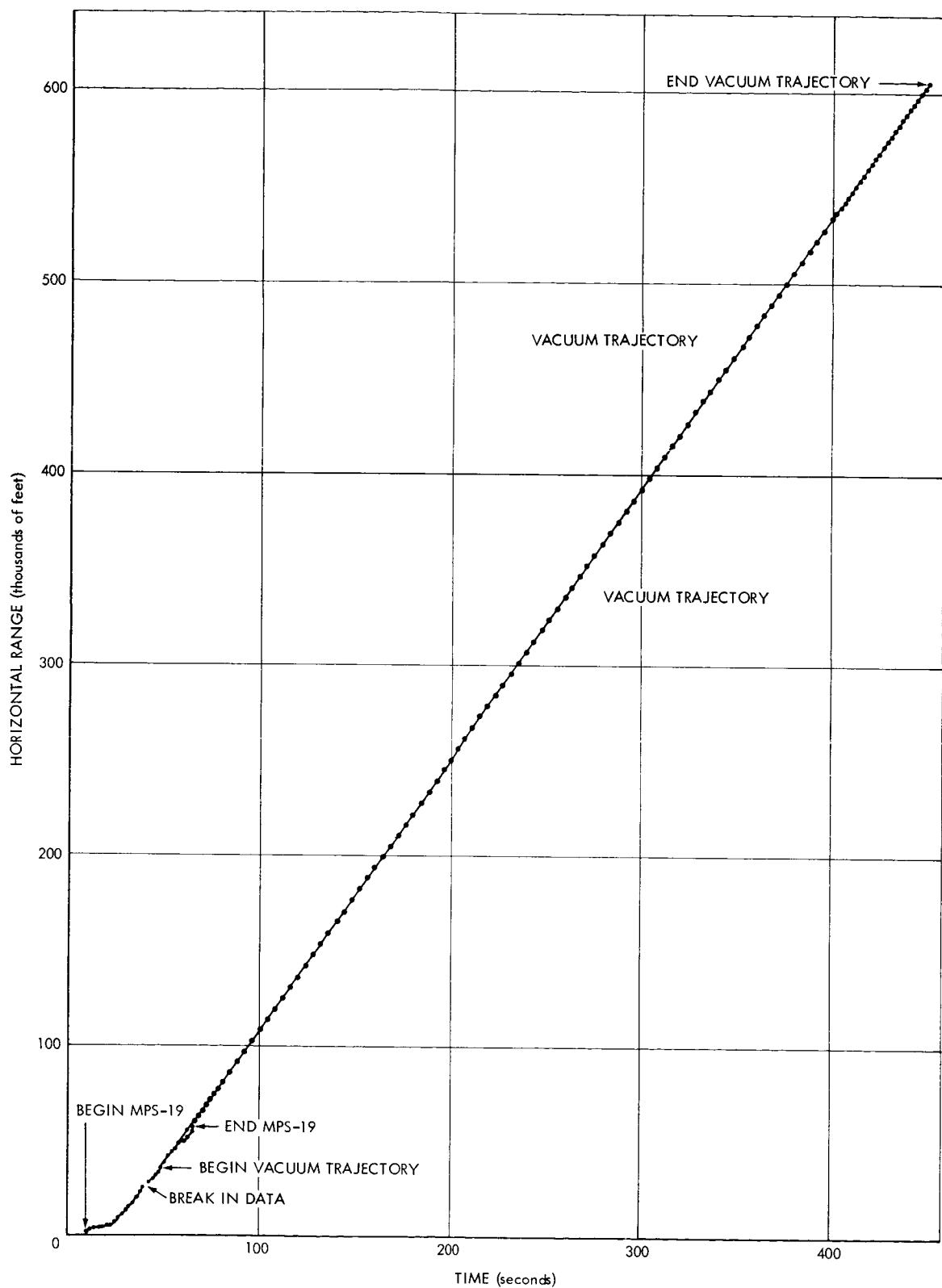


Figure 224. 14.180 GI Radar Plot, Horizontal Range vs Time

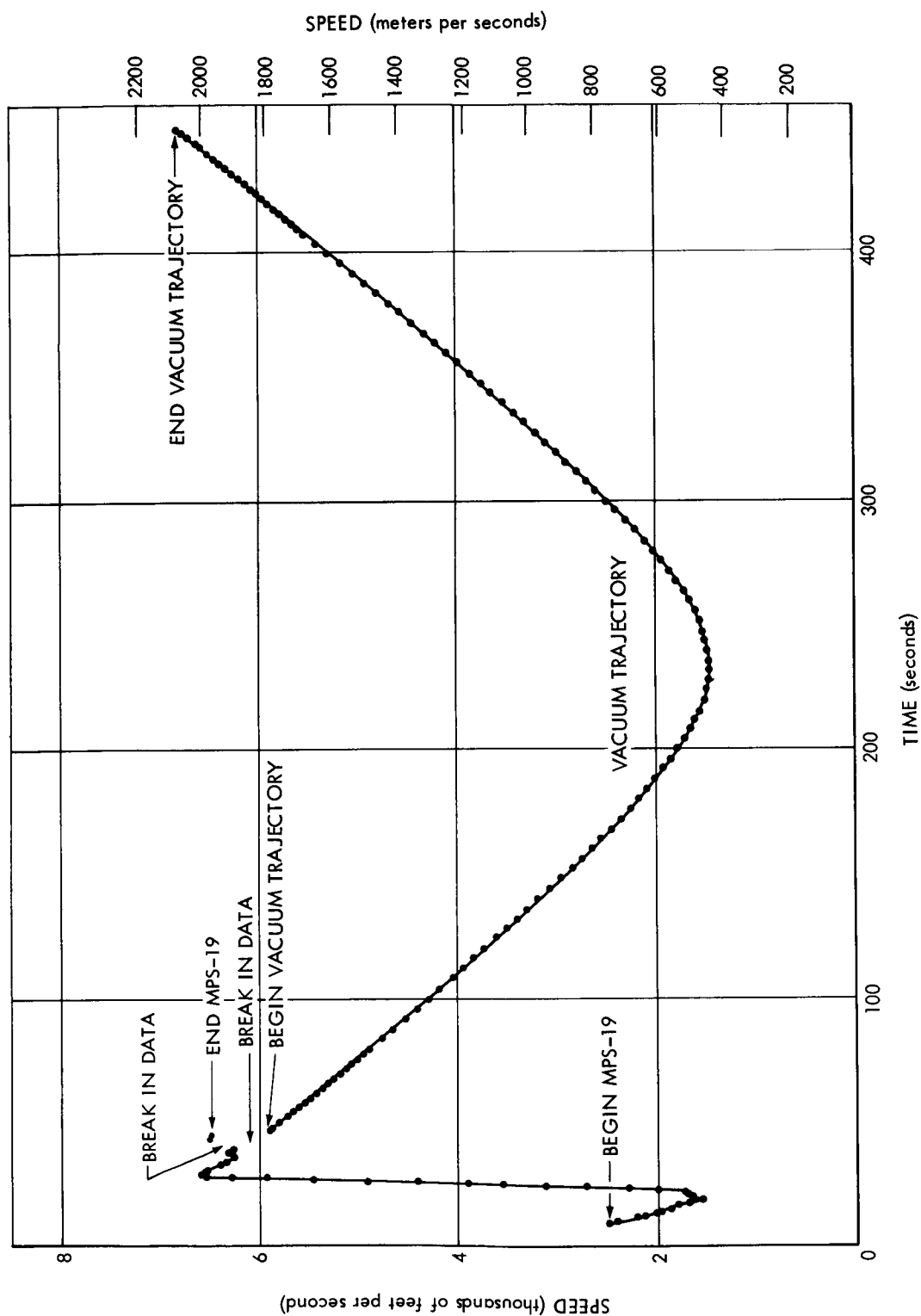


Figure 225. 14.180 GI Radar Plot, Speed vs Time

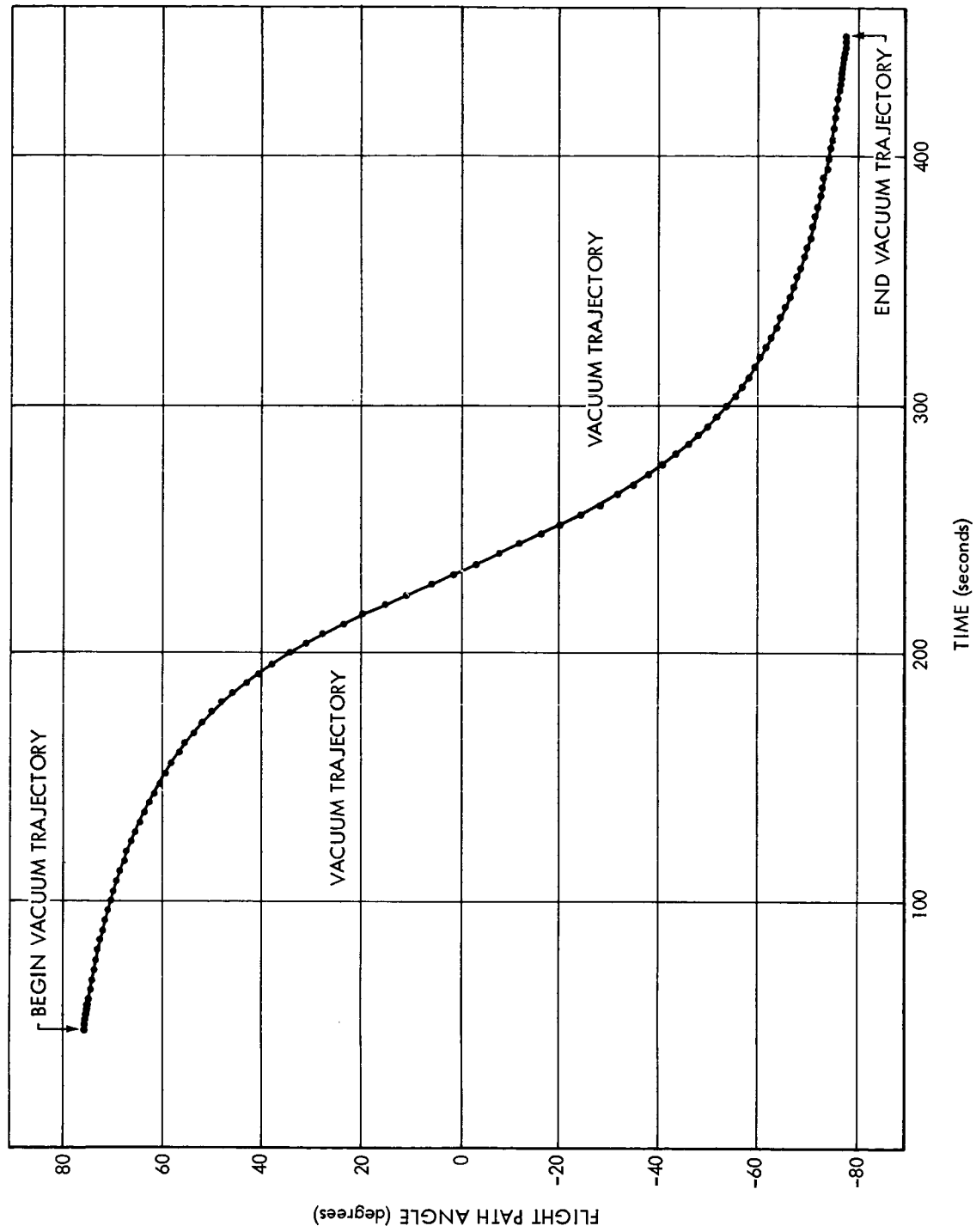


Figure 226. 14.180 GI Radar Plot, Flight Path Angle vs Time

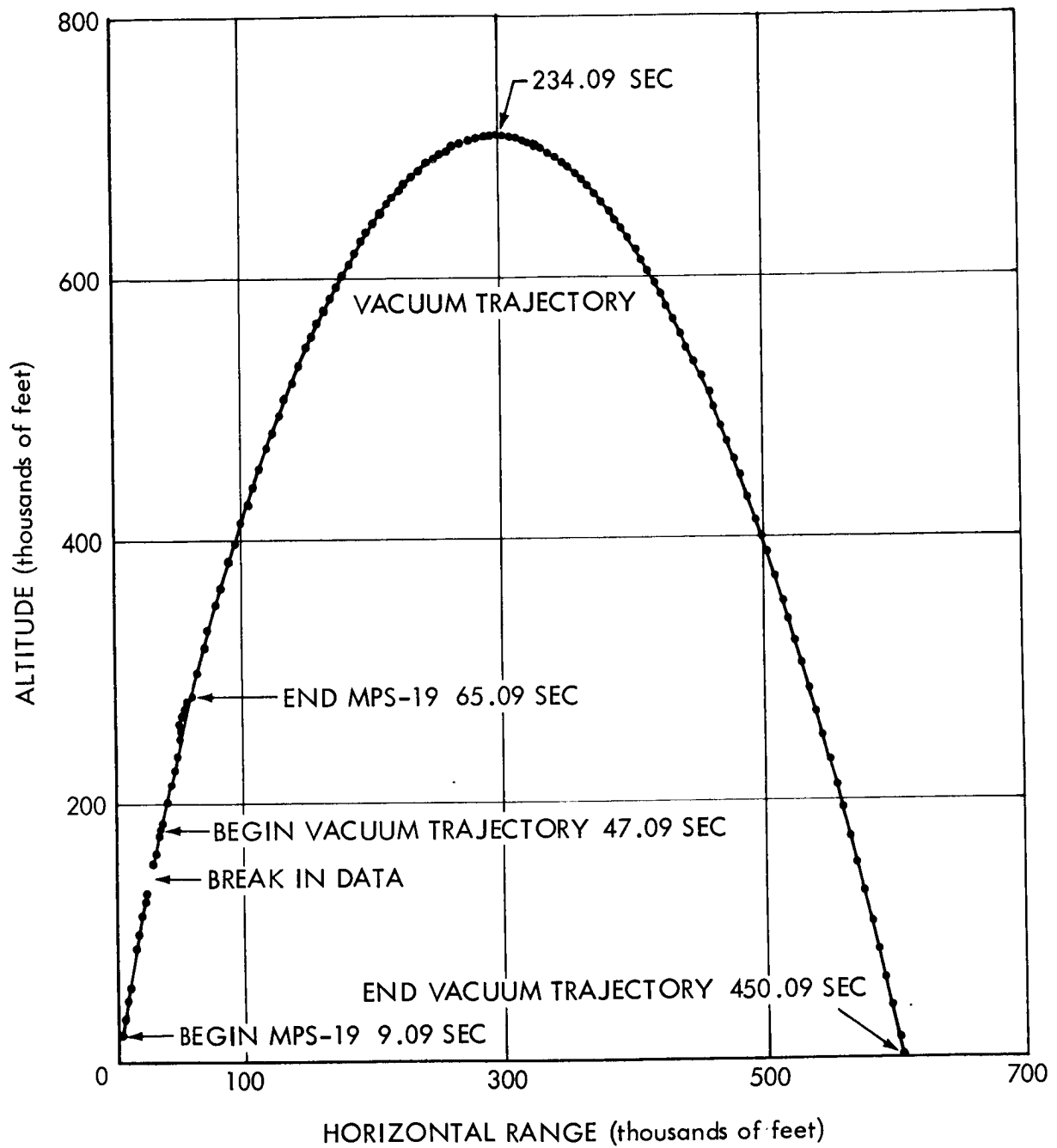


Figure 227. 14.180 GI Radar Plot, Altitude vs Horizontal Range

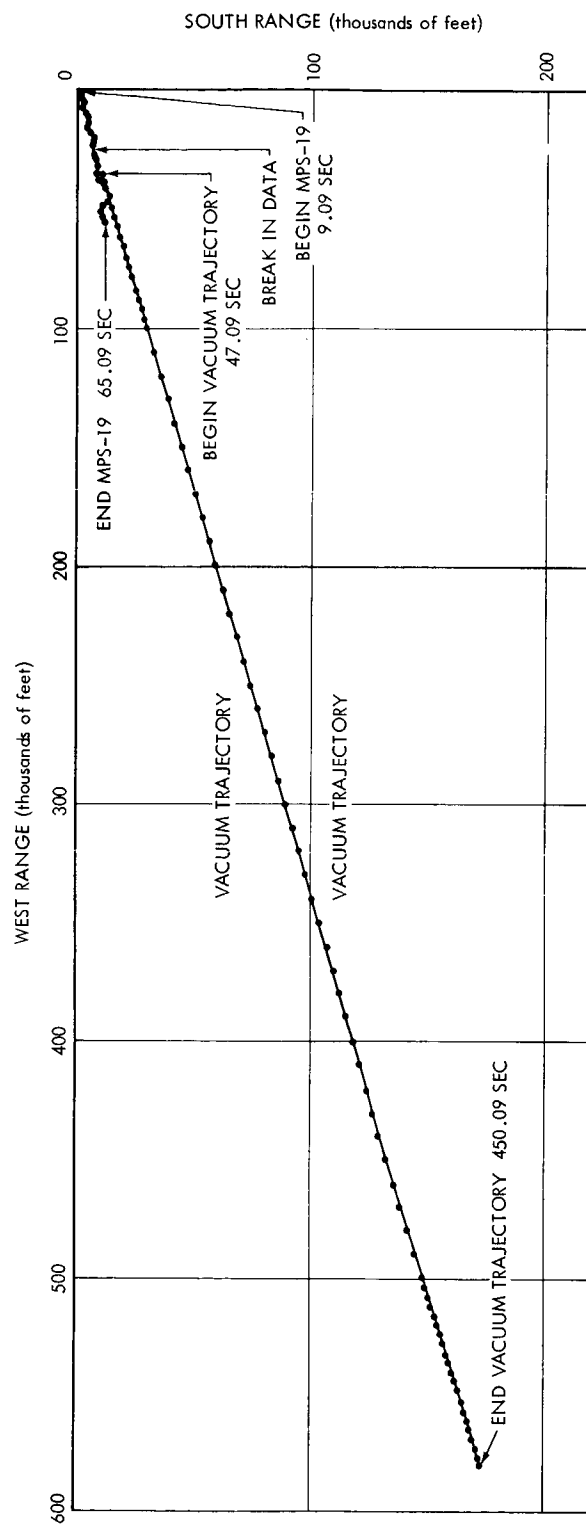


Figure 228. 14.180 GI Radar Plot, South Range vs West Range

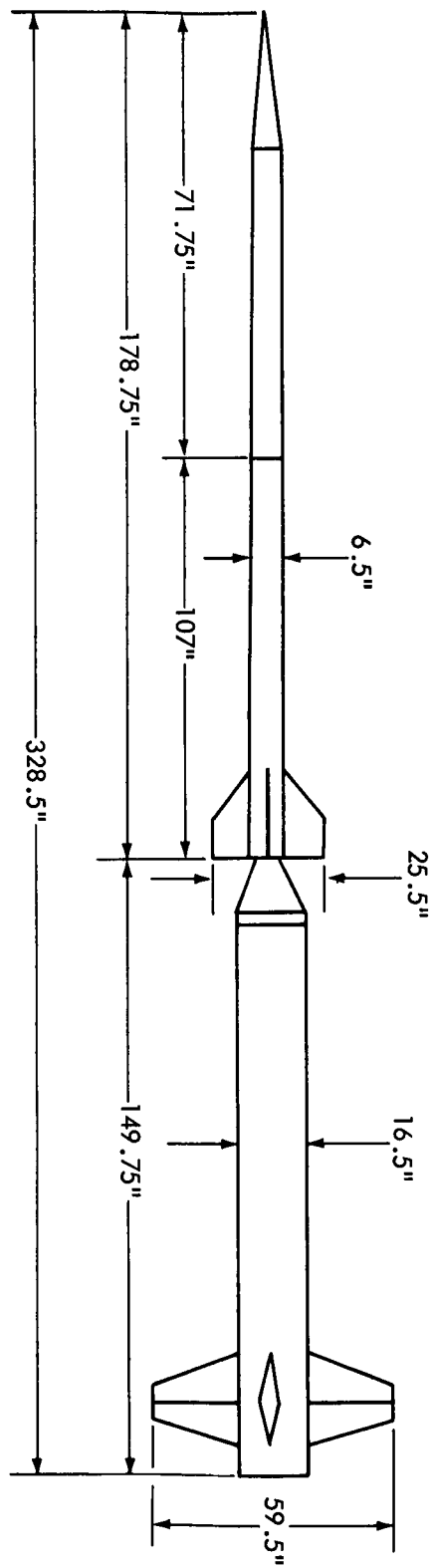


Figure 229. 14.181 GI Sketch



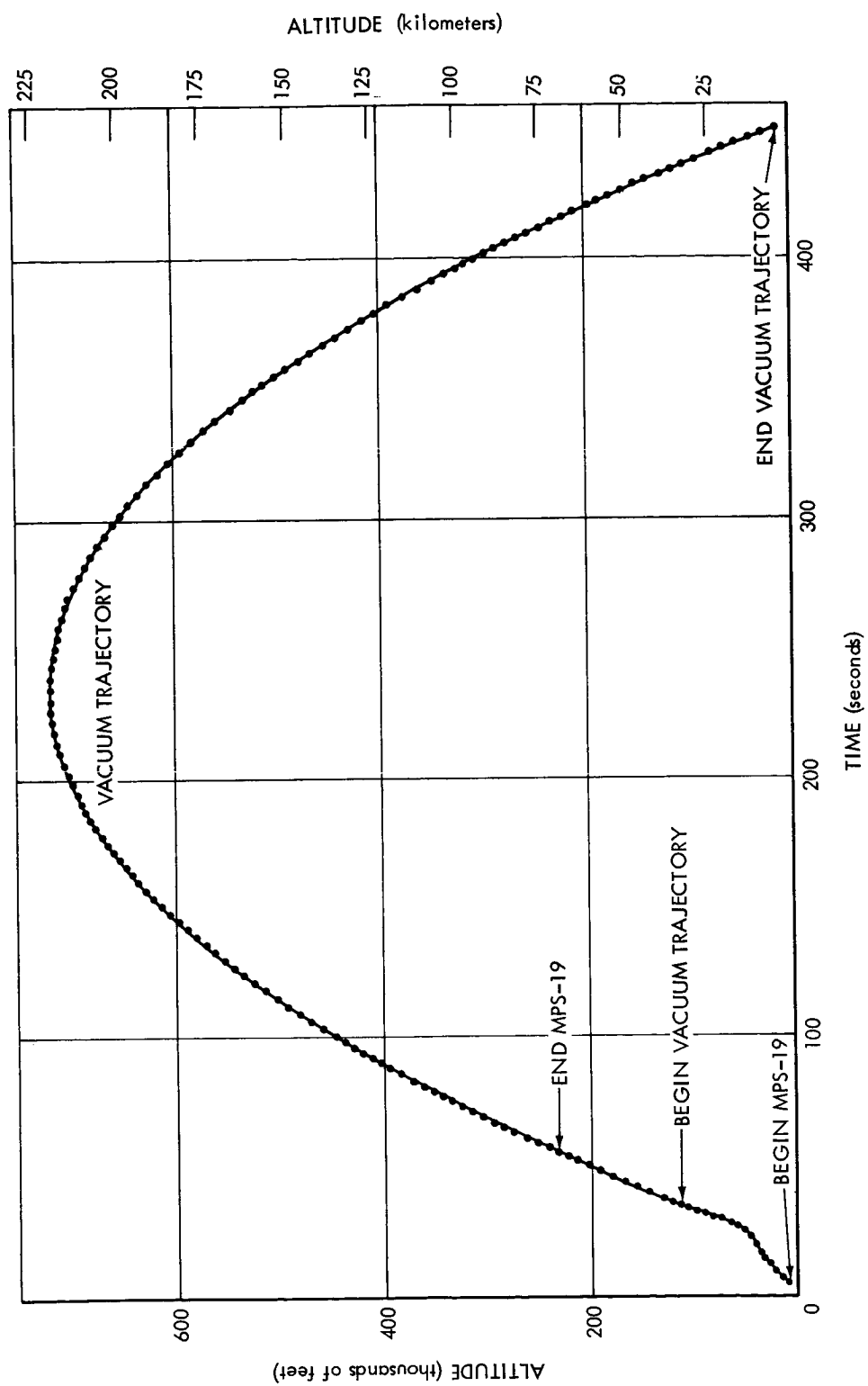


Figure 230. 14.181 GI Radar Plot, Altitude vs Time

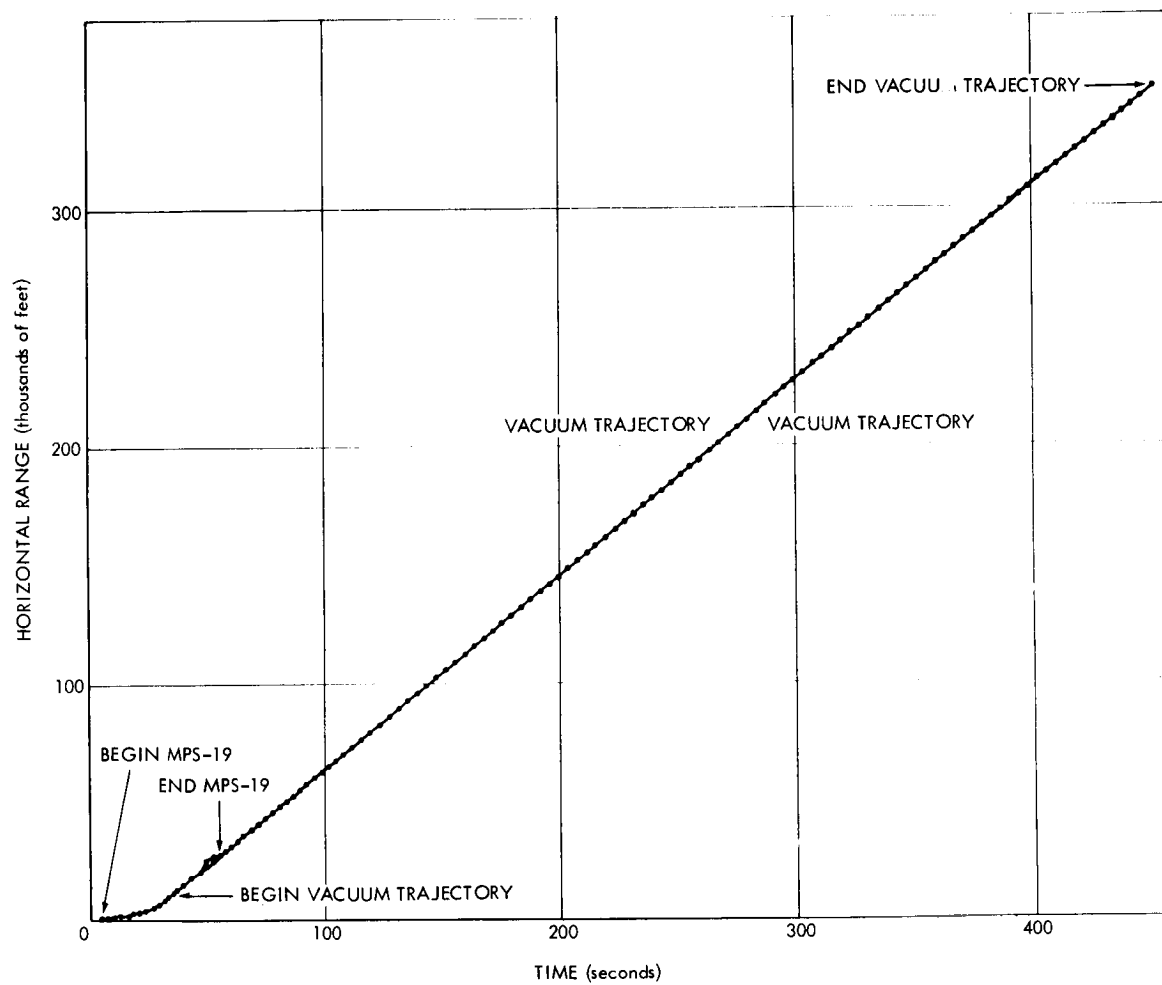


Figure 231. 14.181 GI Radar Plot, Horizontal Range vs Time

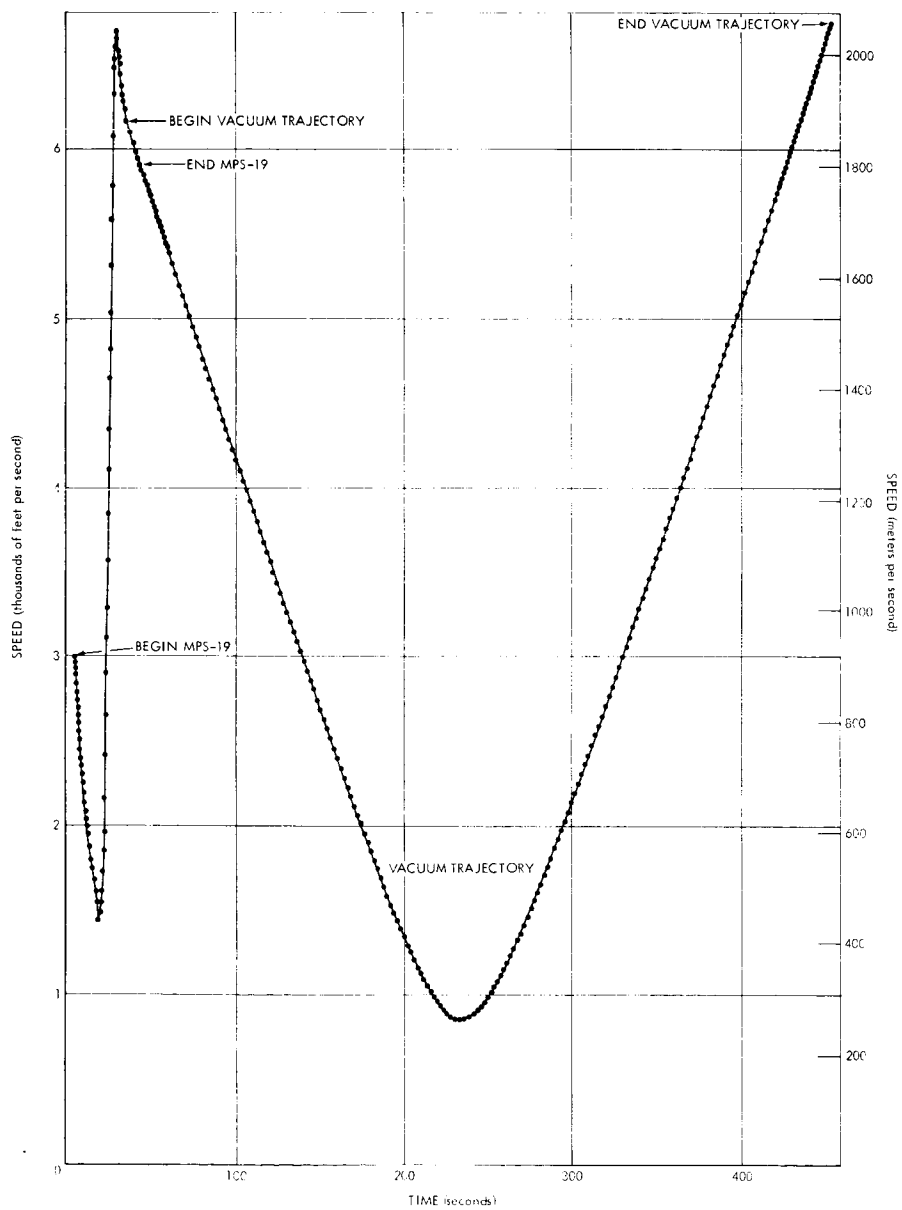


Figure 232. 14.181 GI Radar Plot, Speed vs Time

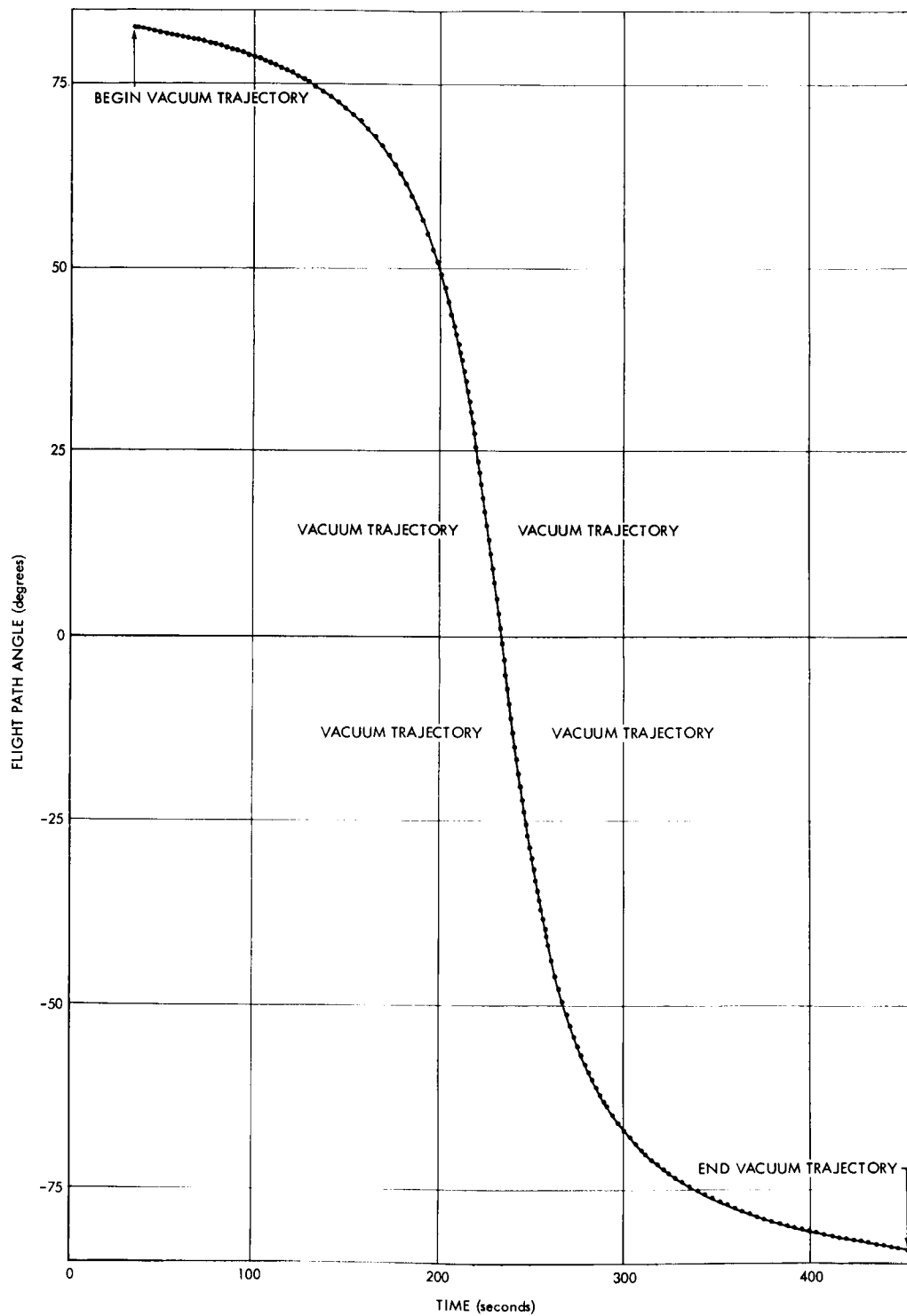


Figure 233. 14.181 GI Radar Plot, Flight Path Angle vs Time

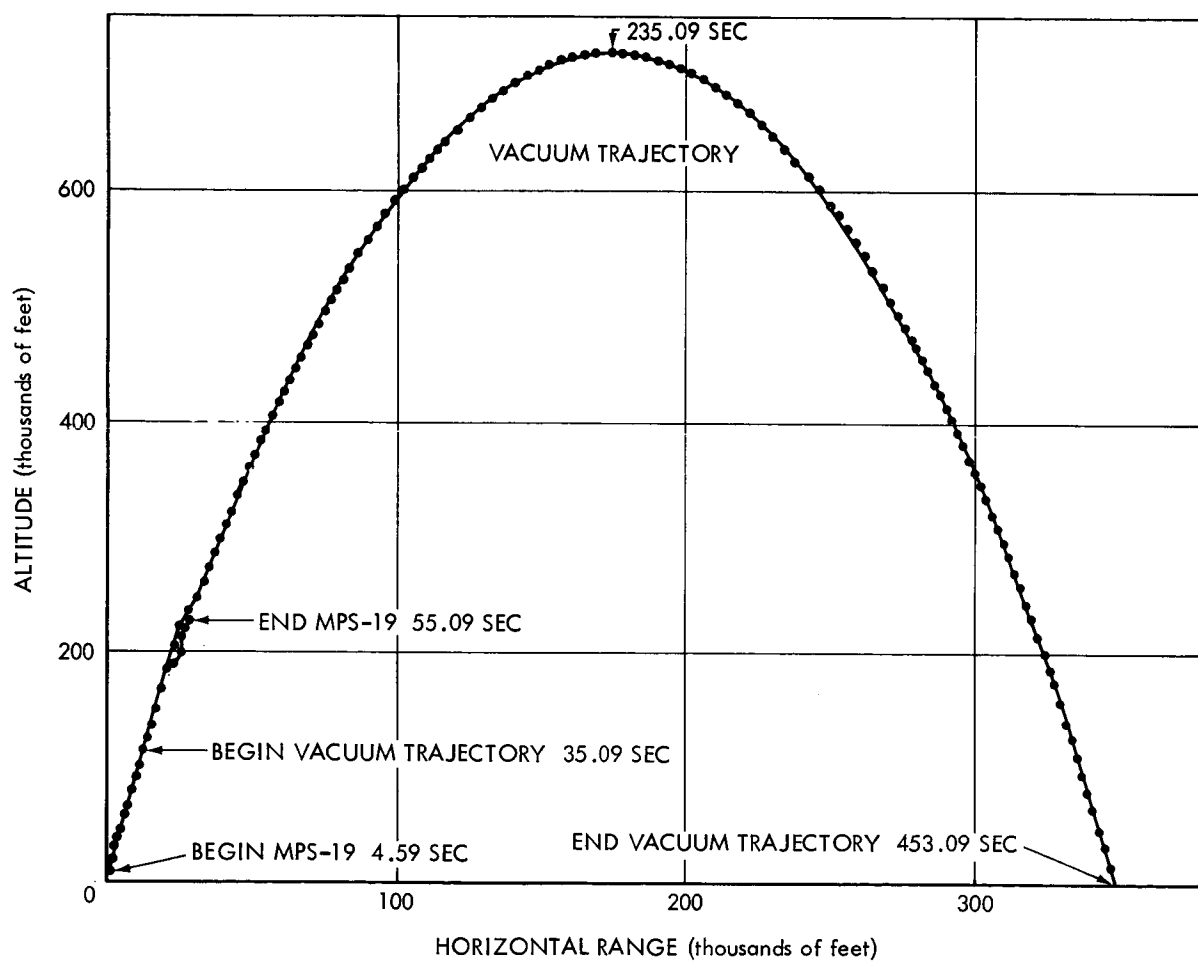


Figure 234. 14.181 GI Radar Plot, Altitude vs Horizontal Range

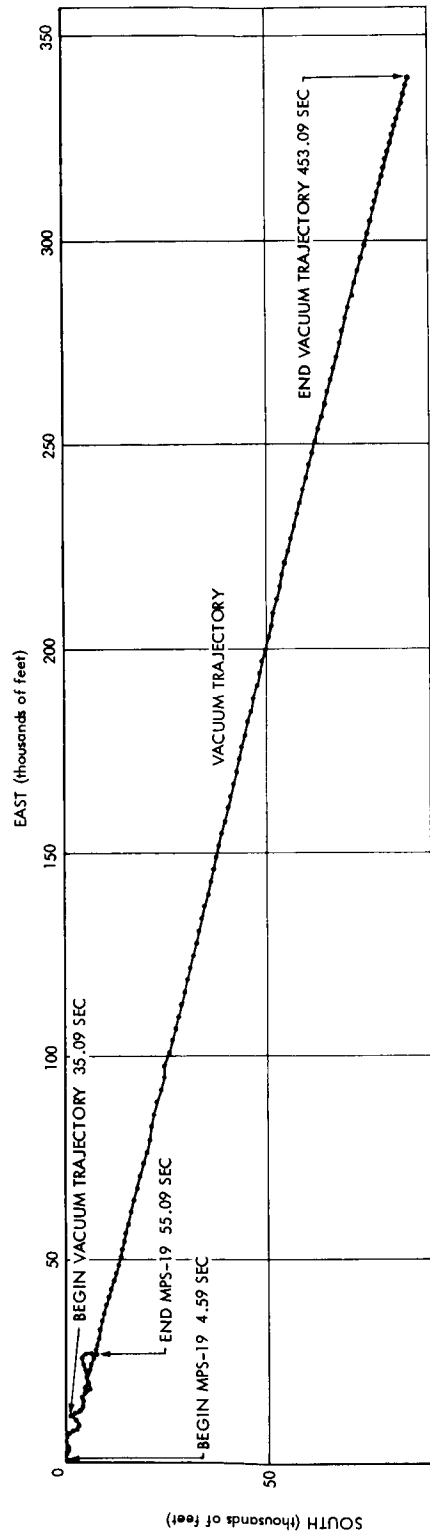


Figure 235. 14.18! GI Radar Plot, South Range vs East Range

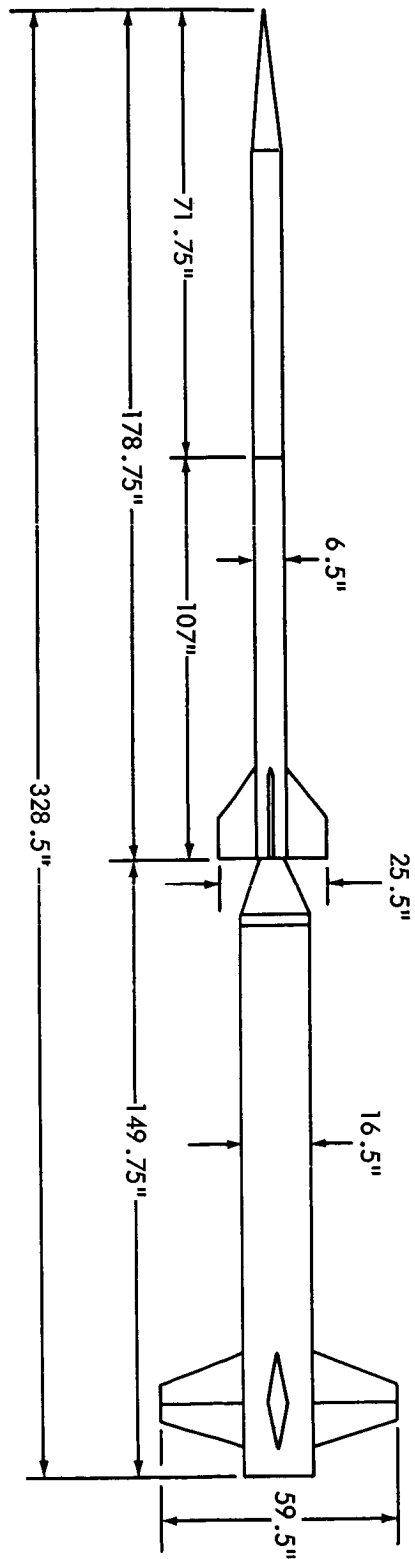


Figure 236. 14.182 GI Sketch

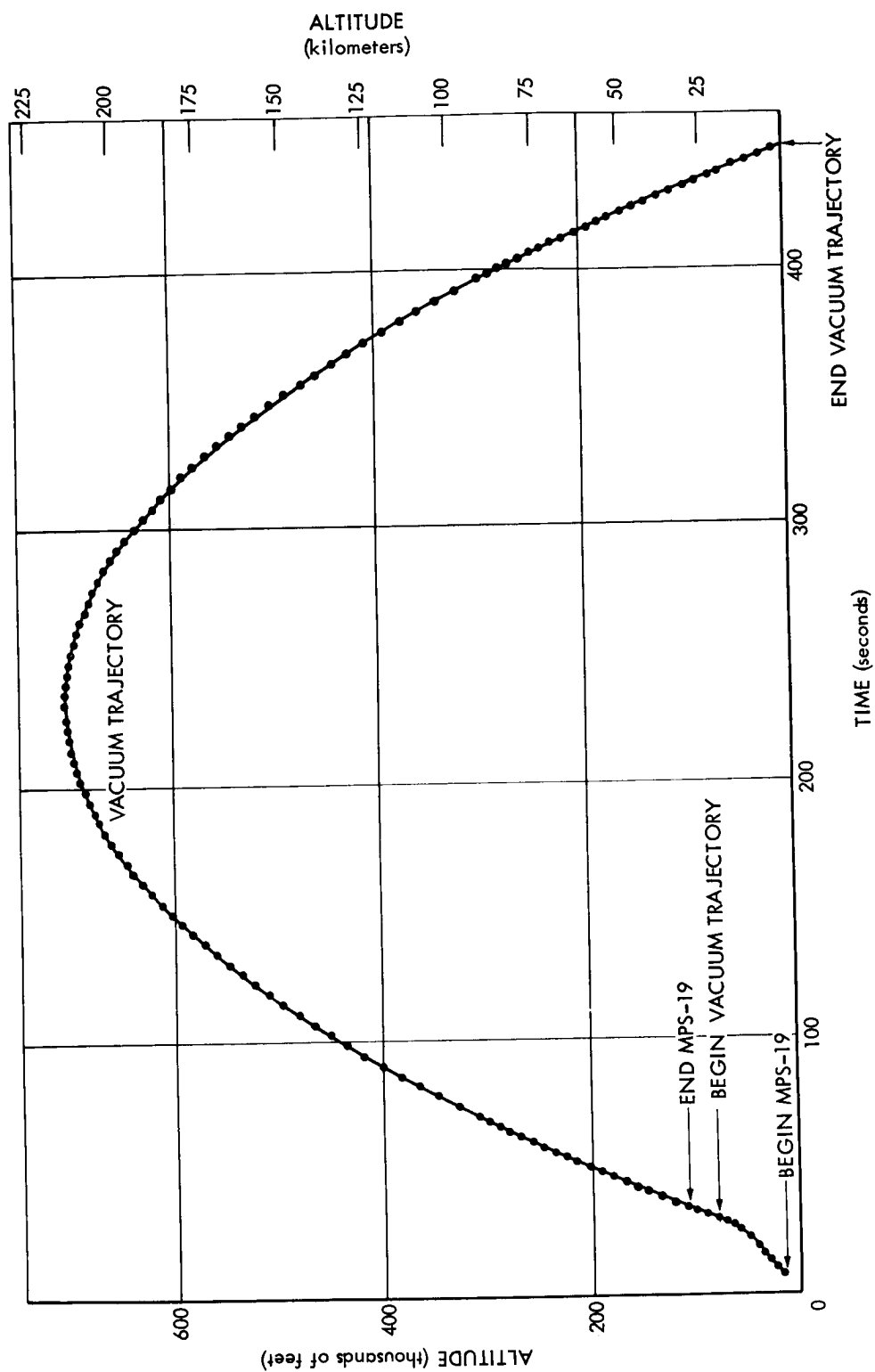


Figure 237. 14.182 GI Radar Plot, Altitude vs Time



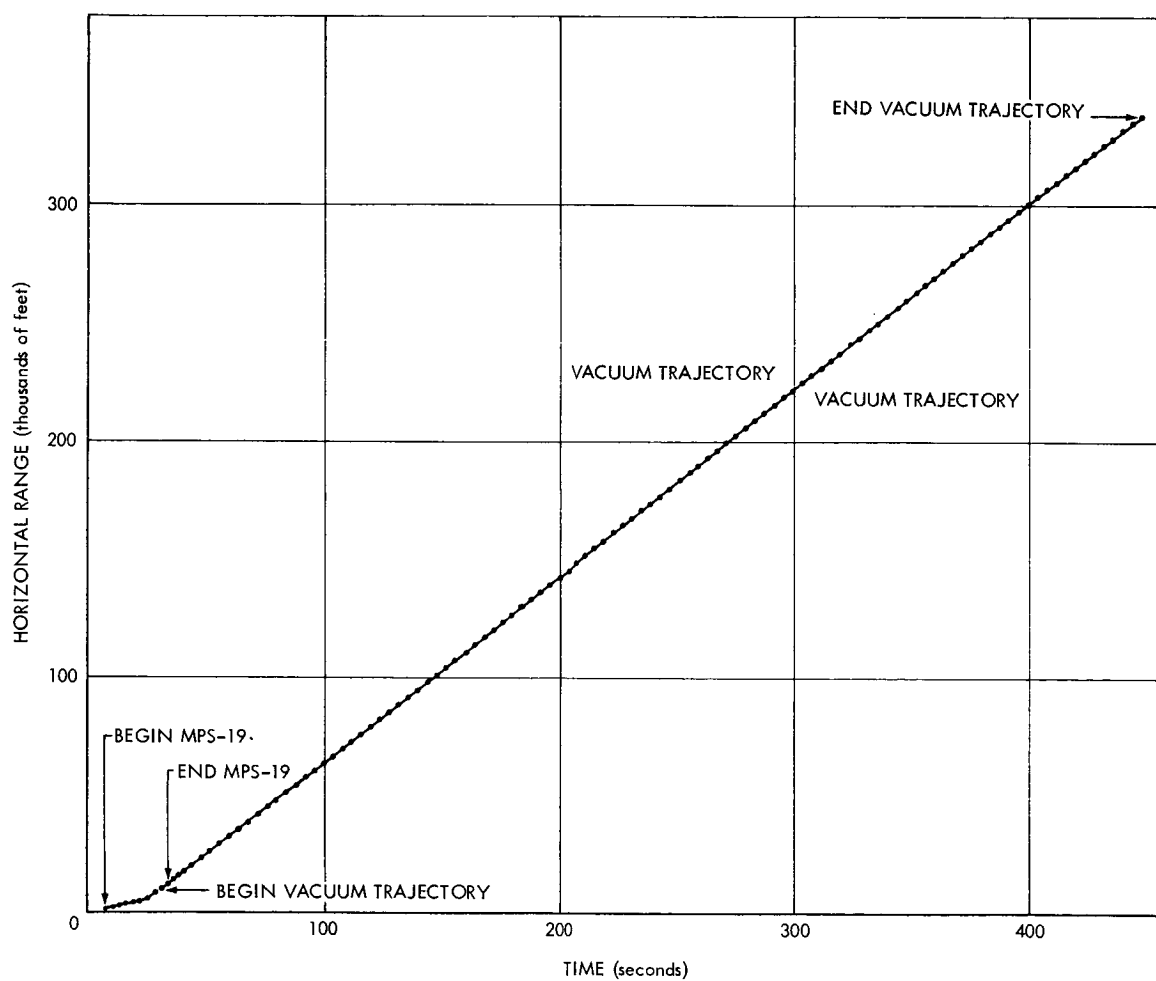


Figure 238. 14.182 GI Radar Plot, Horizontal Range vs Time

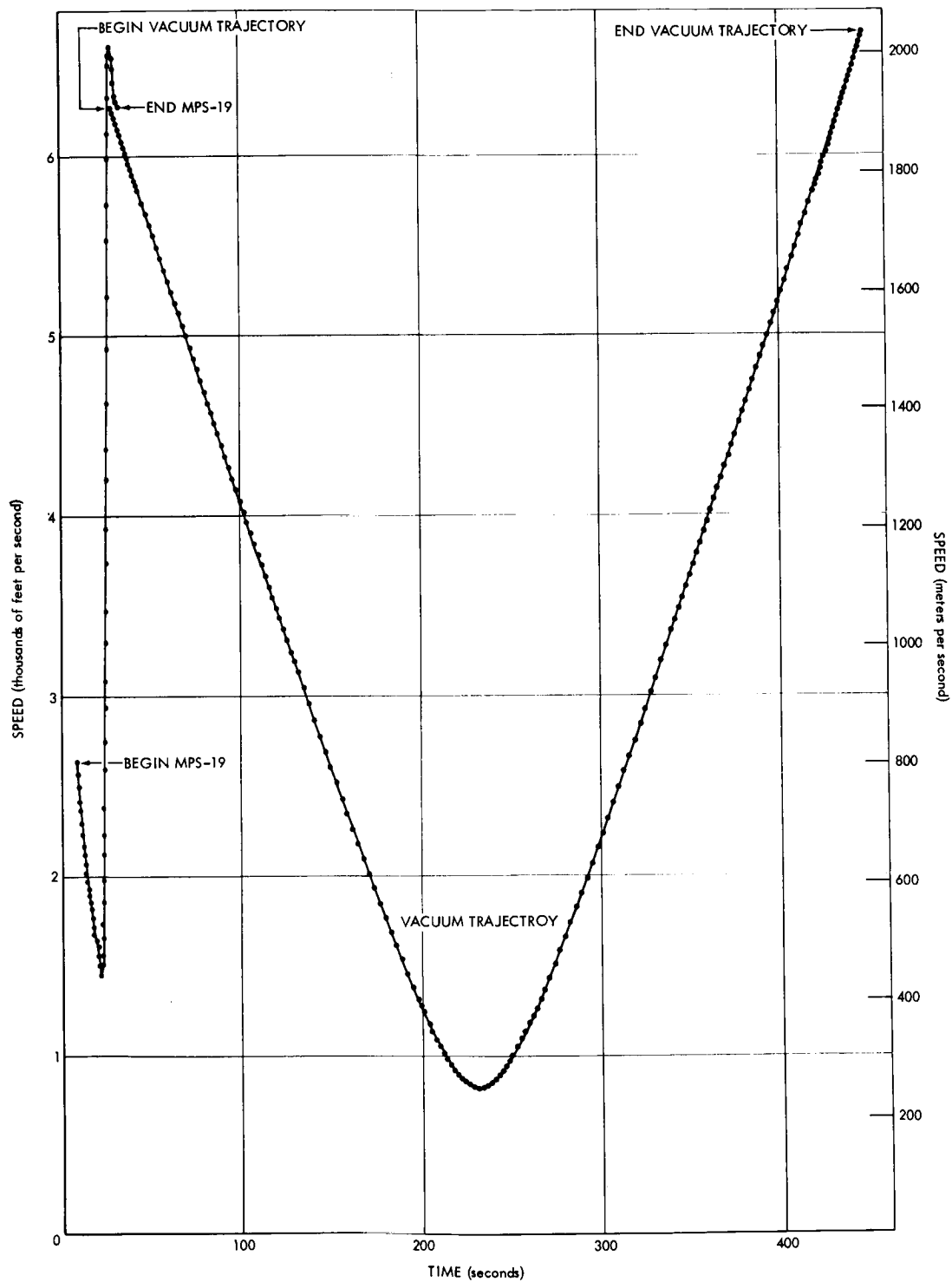


Figure 239. 14.182 GI Radar Plot, Speed vs Time

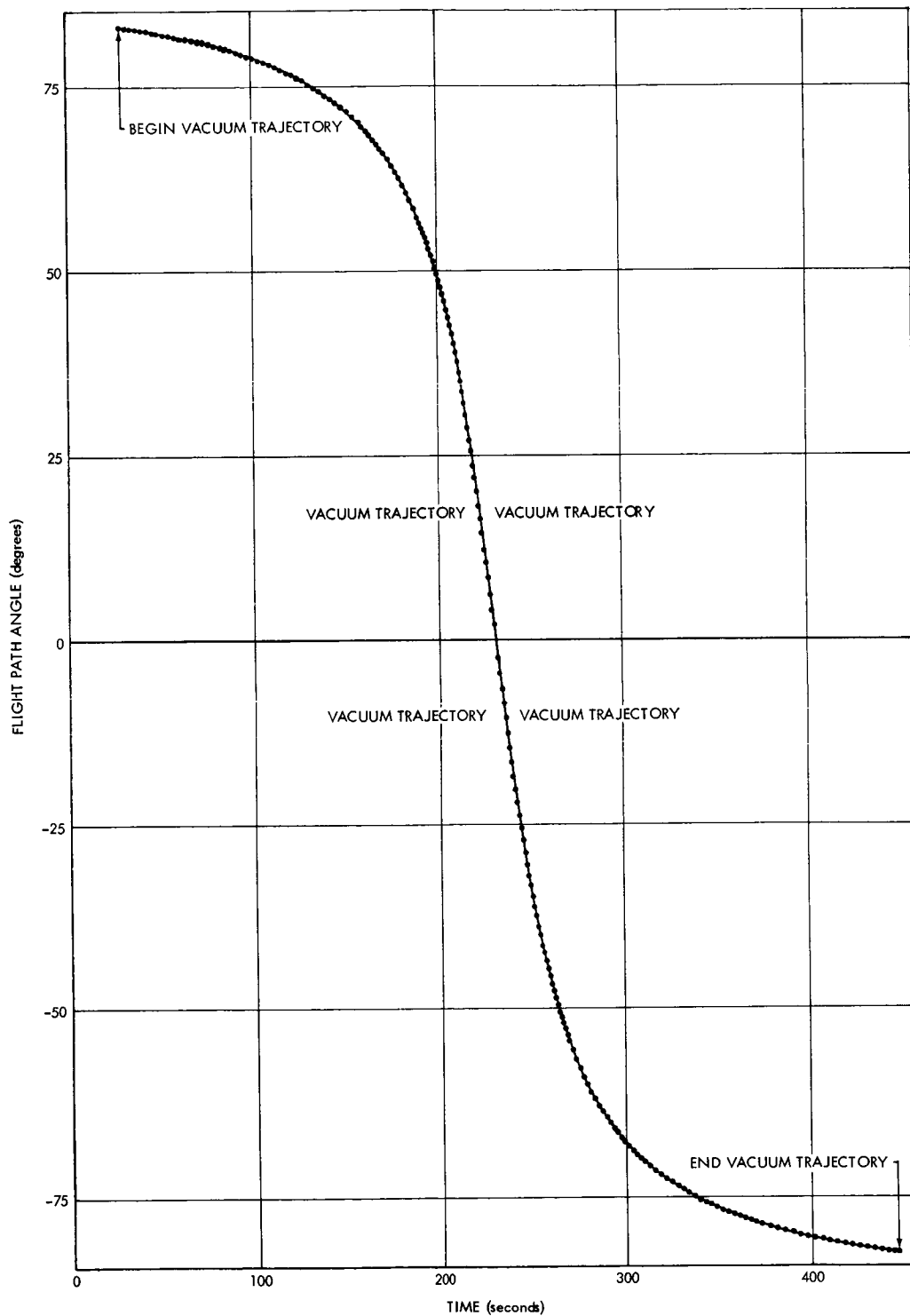


Figure 240. 14.182 GI Radar Plot, Flight Path Angle vs Time

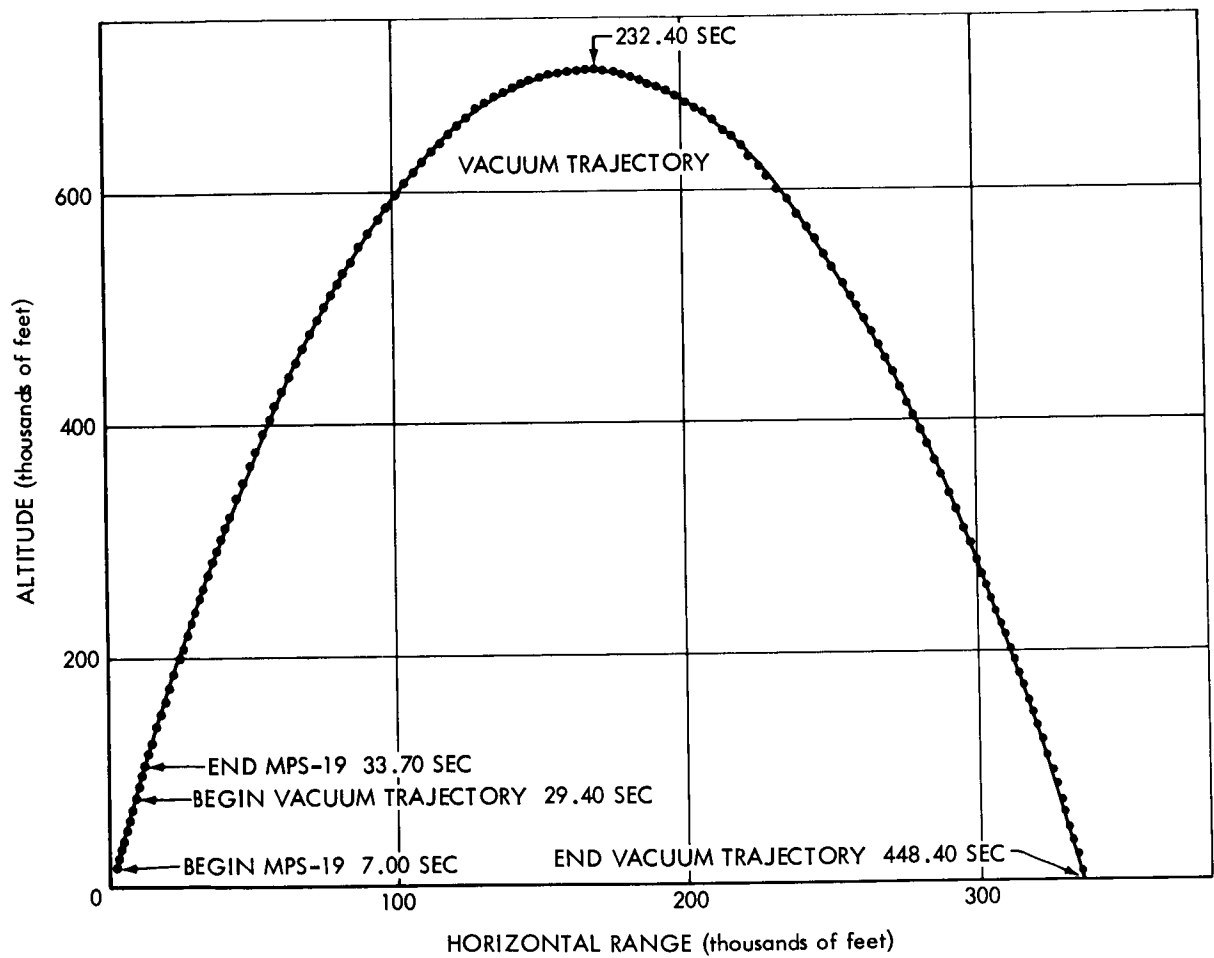


Figure 241. 14.182 GI Radar Plot, Altitude vs Horizontal Range

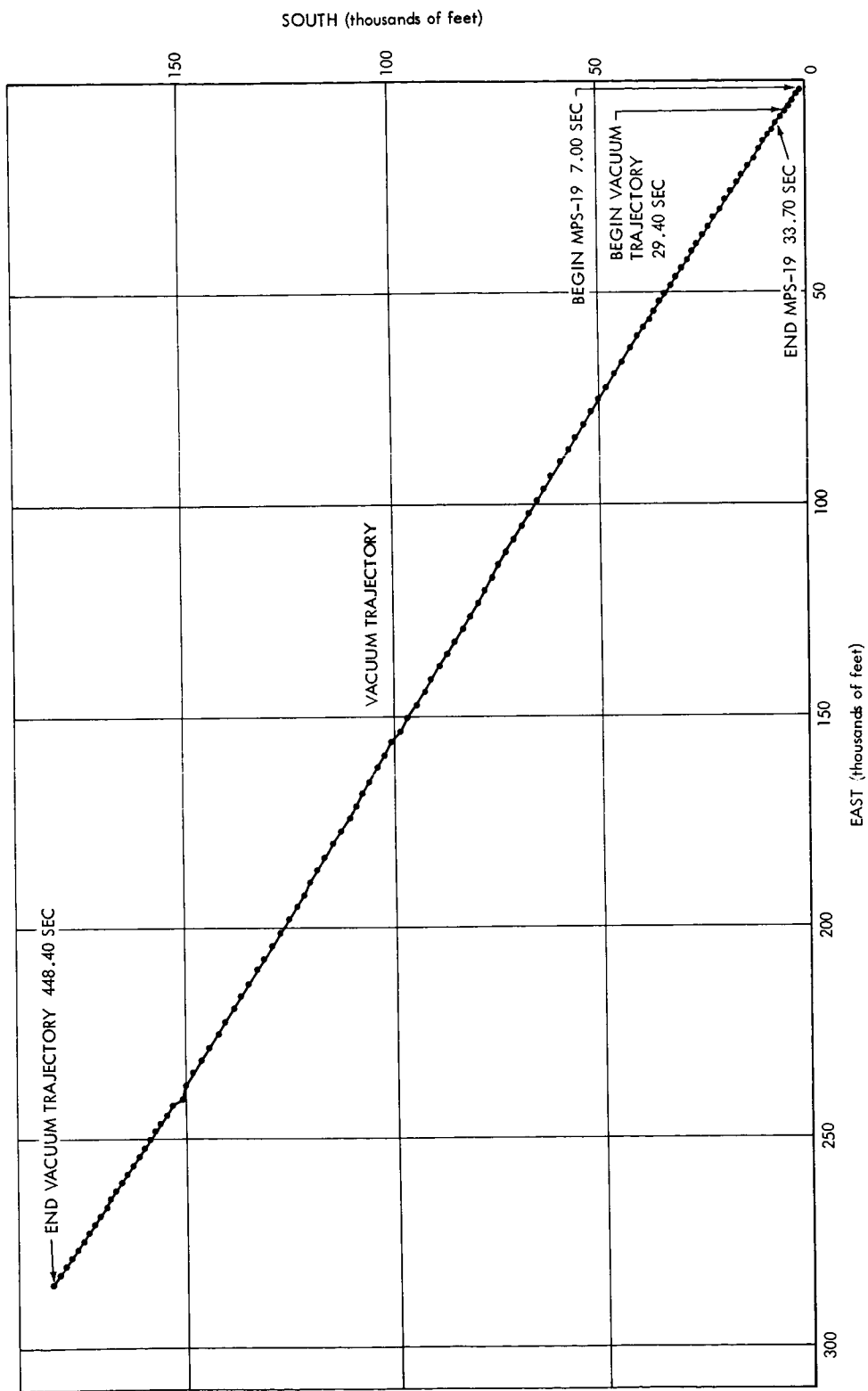


Figure 242. 14.182 GI Radar Plot, South Range vs East Range

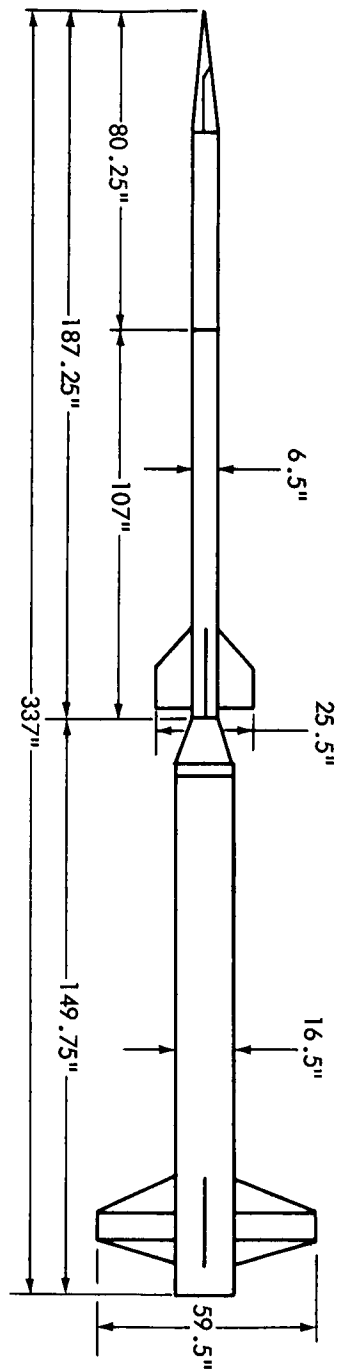


Figure 243. 14,184 UE Sketch

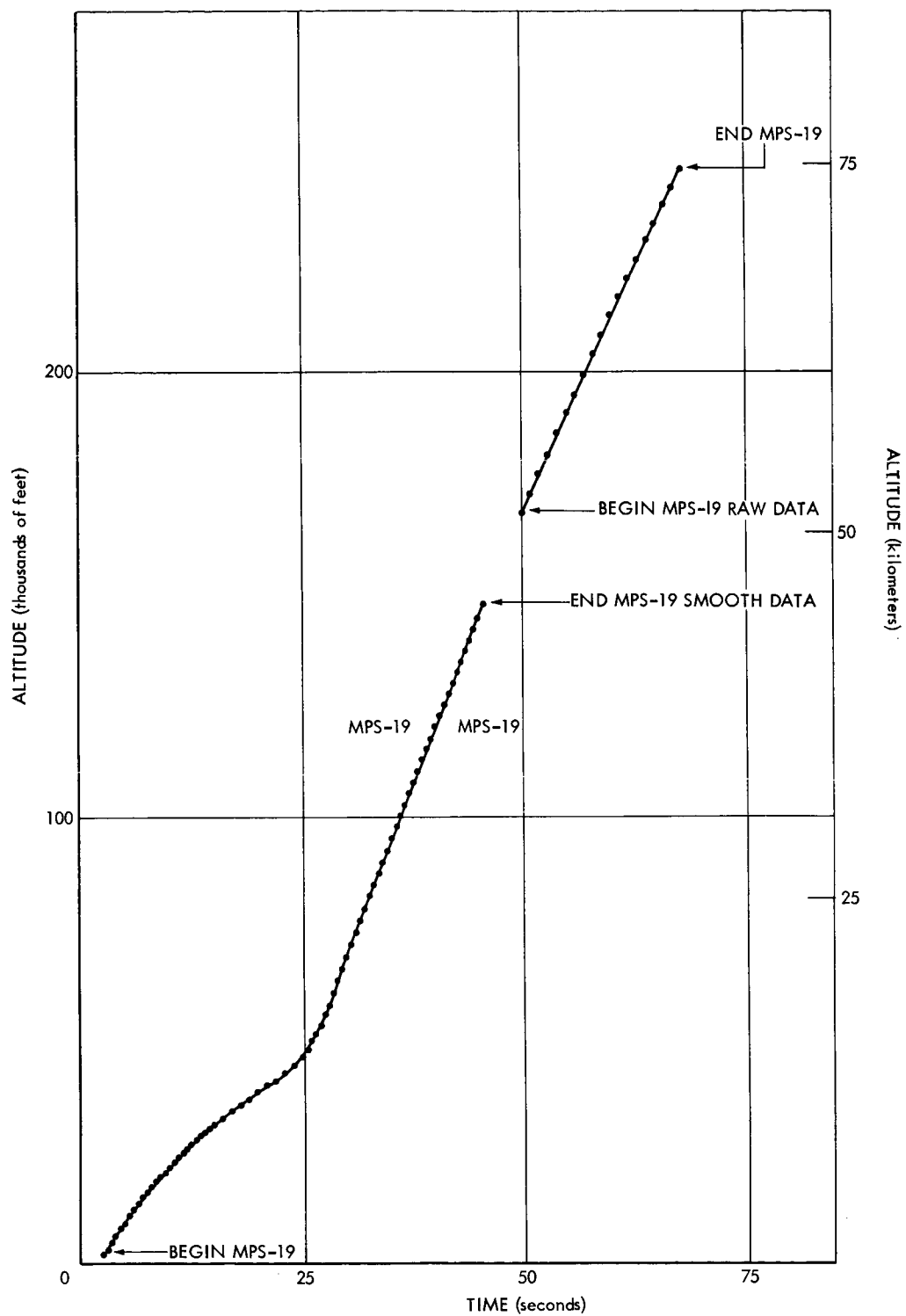


Figure 244. 14.184 UE Radar Plot, Altitude vs Time

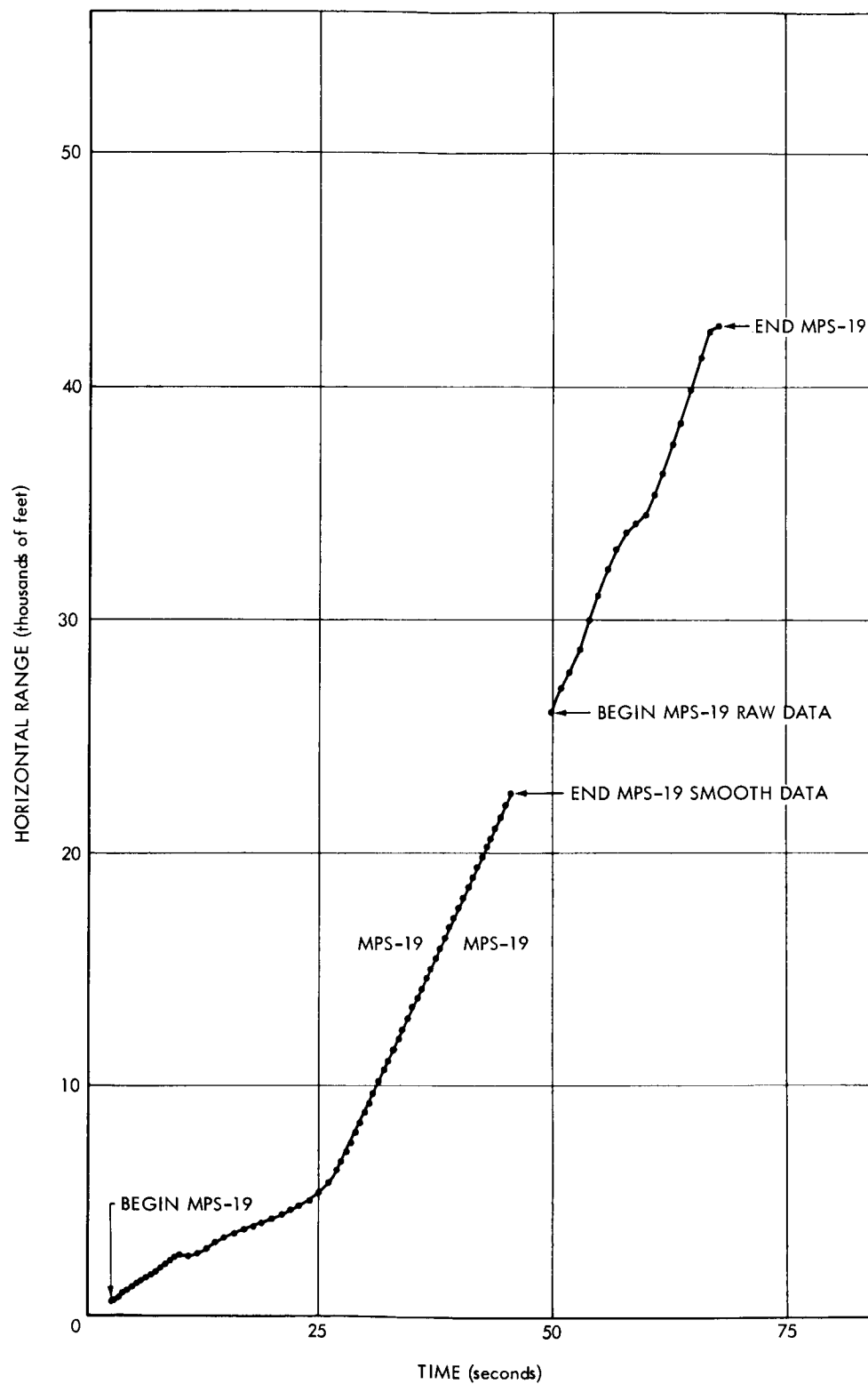


Figure 245. 14.184 UE Radar Plot, Horizontal Range vs Time



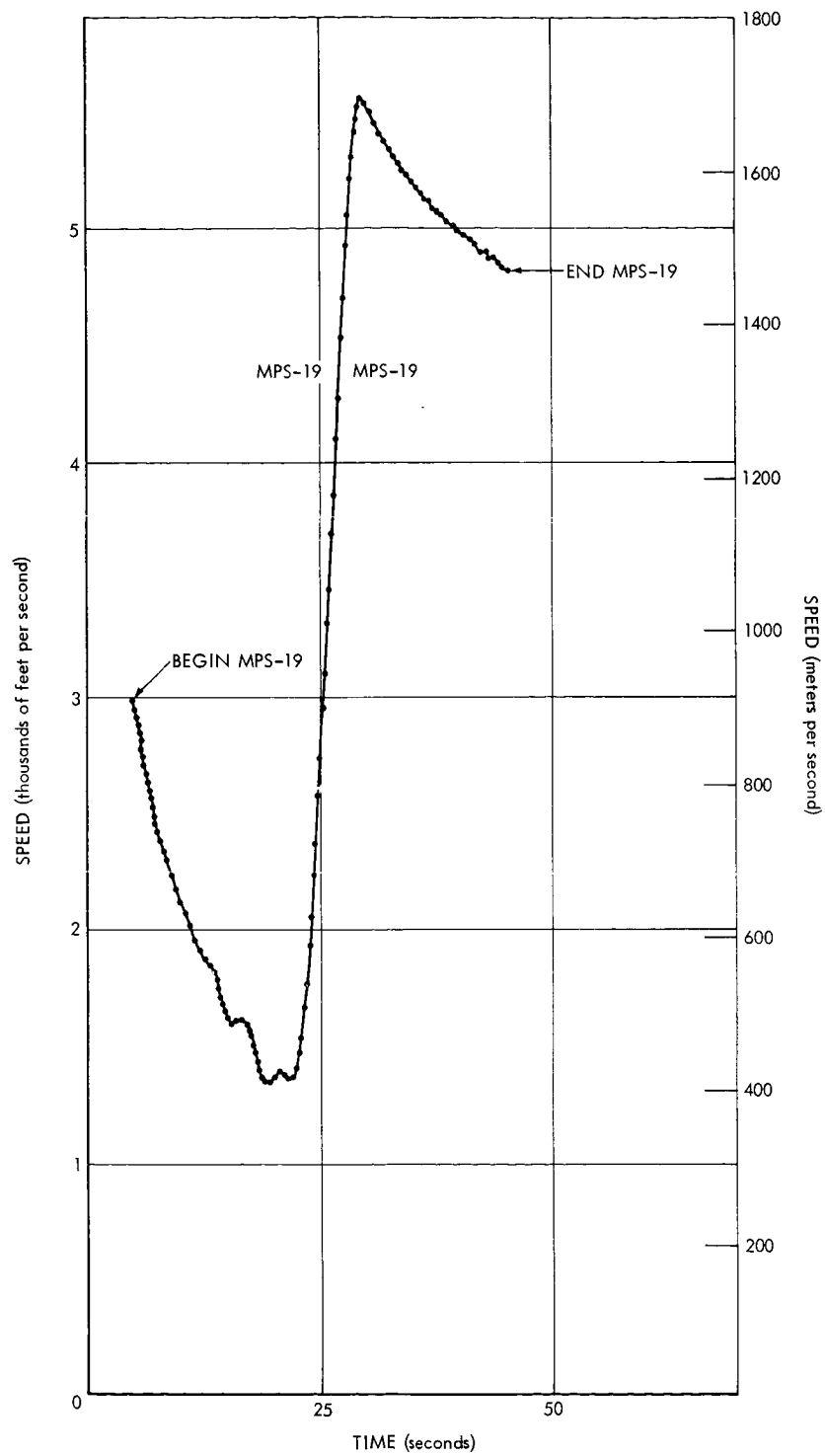


Figure 246. 14.184 UE Radar Plot, Speed vs Time

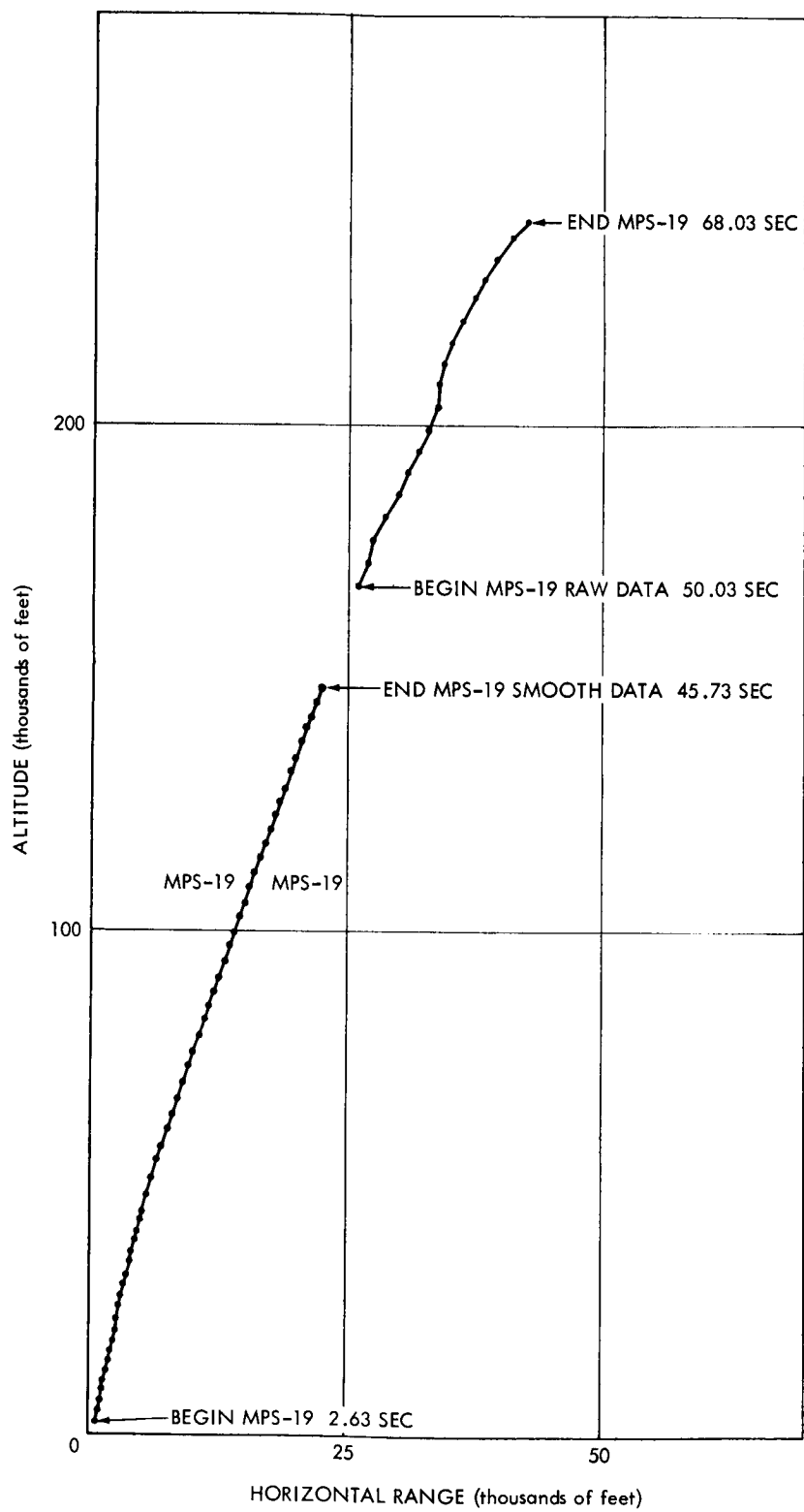


Figure 247. 14.184 UE Radar Plot, Altitude vs Horizontal Range

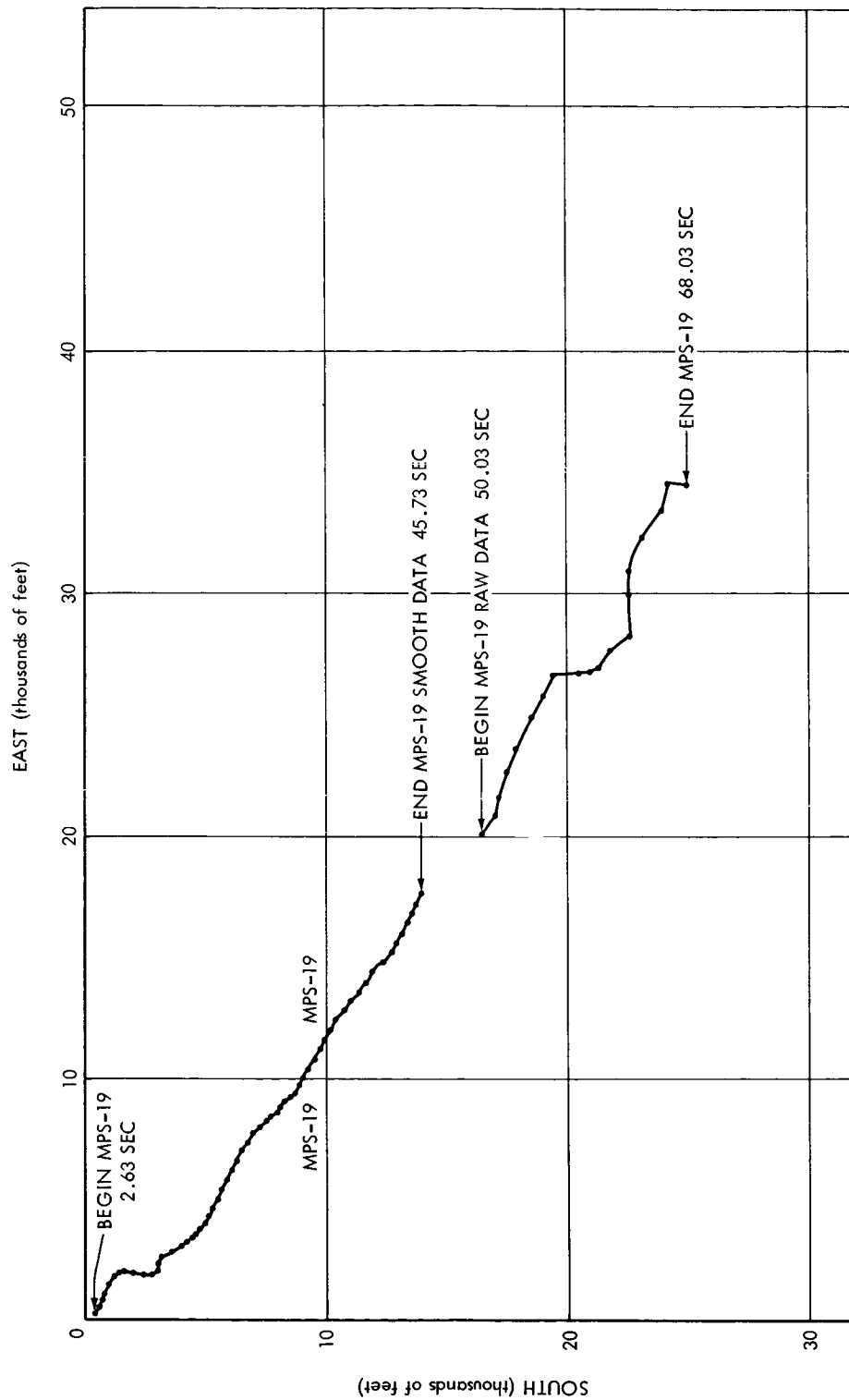


Figure 248. 14.184 UE Radar Plot, South Range vs East Range

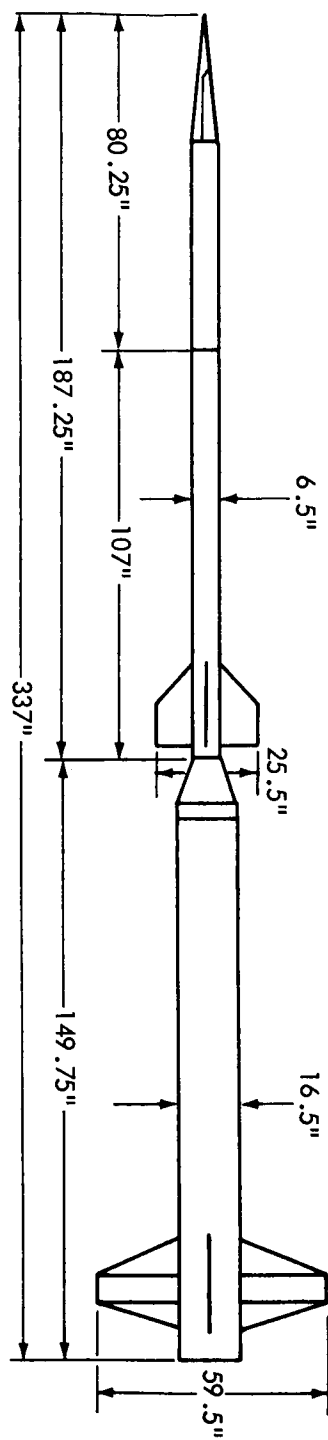


Figure 249. 14.185 UE Sketch

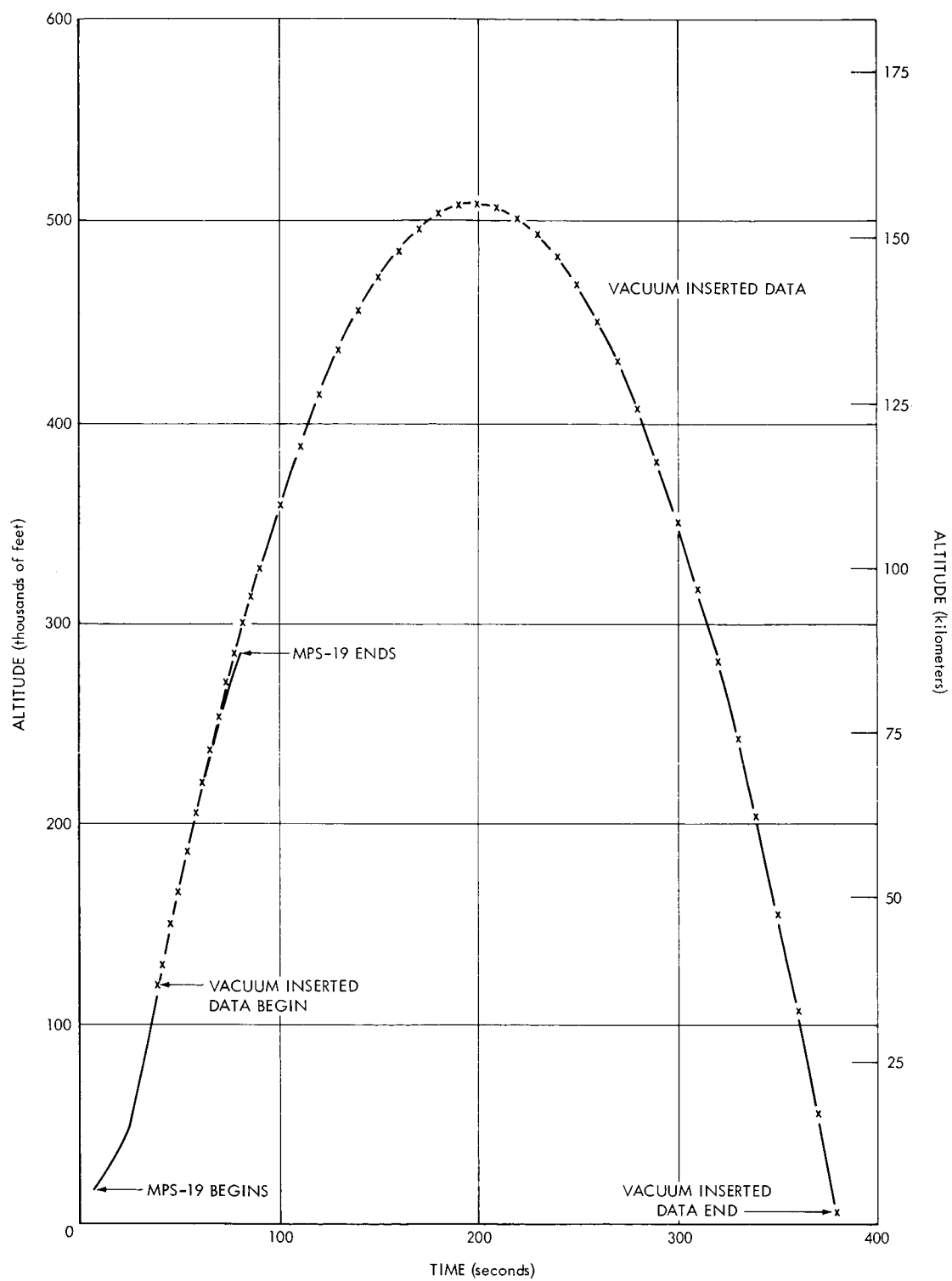


Figure 250. 14.185 UE Radar Plot, Altitude vs Time

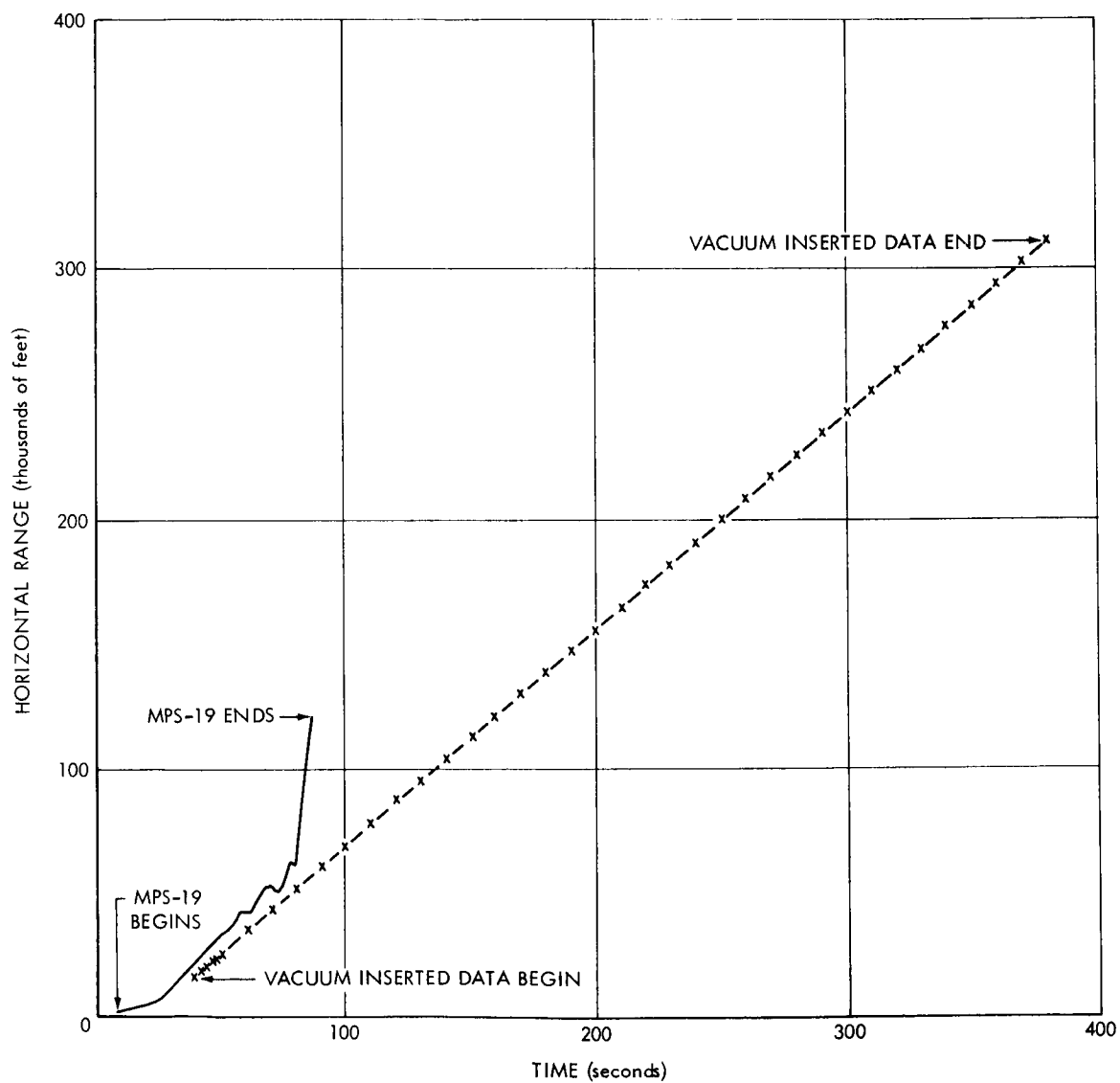


Figure 251. 14.185 UE Radar Plot, Horizontal Range vs Time

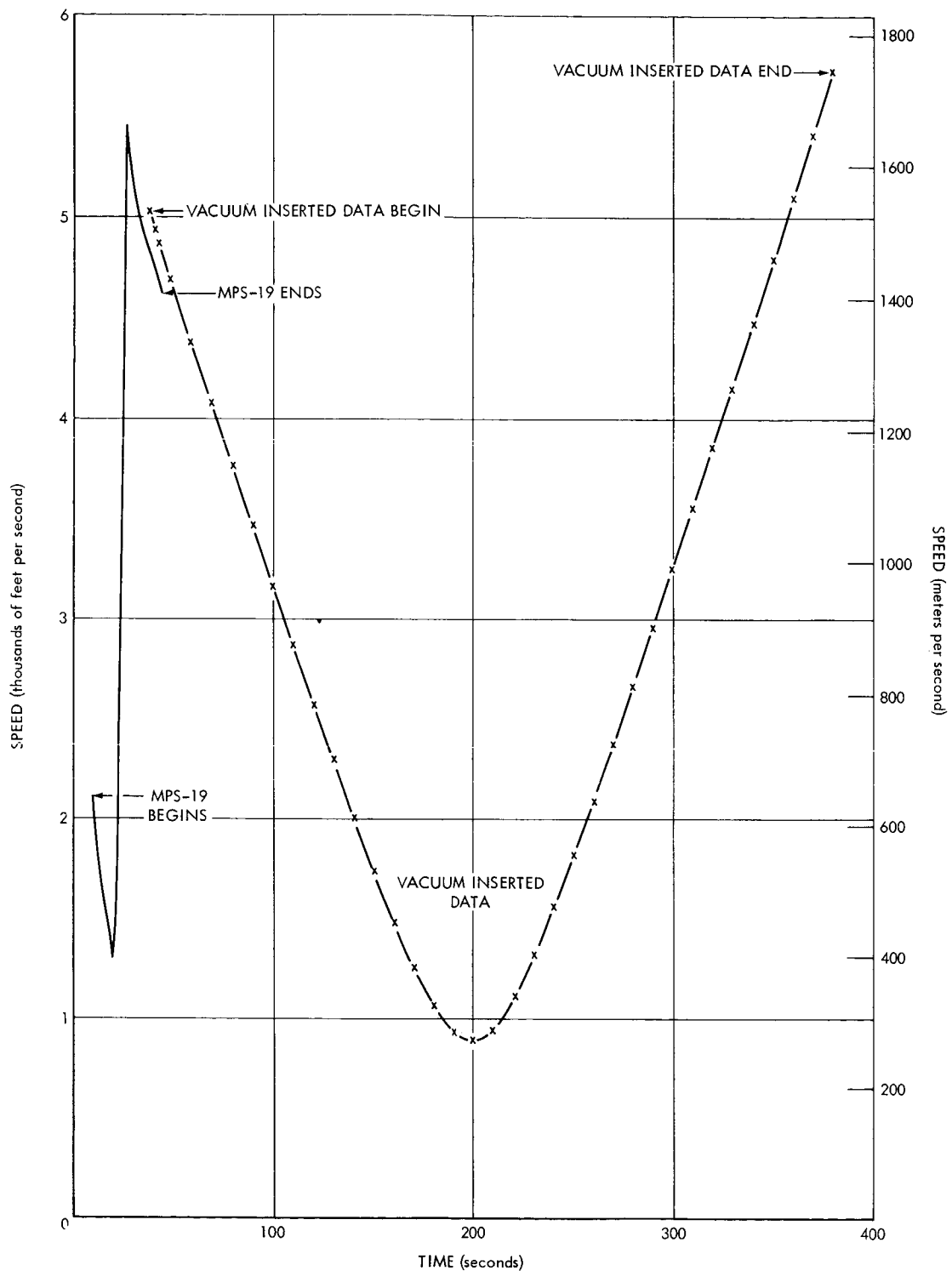


Figure 252. 14.185 UE Radar Plot, Speed vs Time

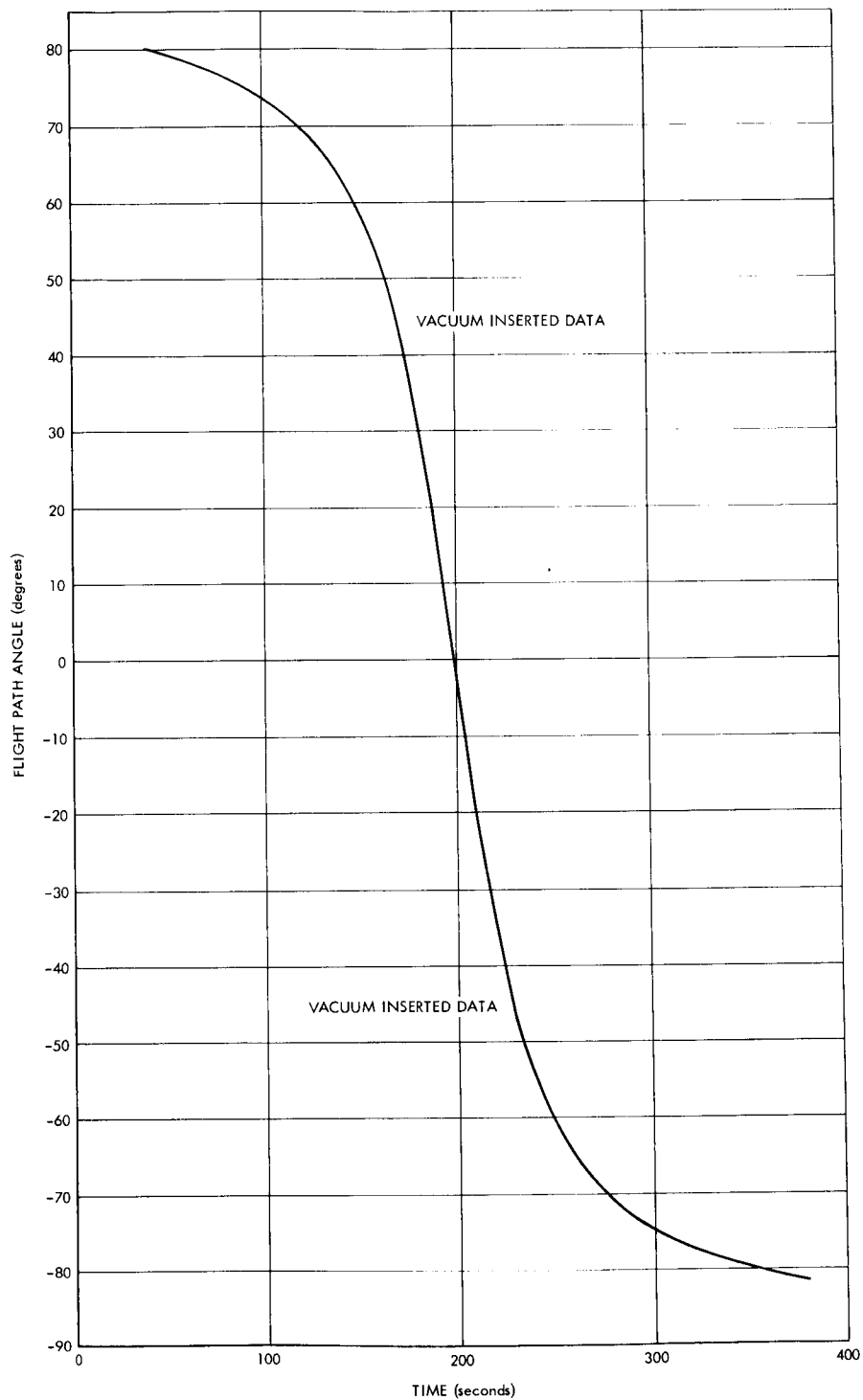


Figure 253. 14.185 UE Radar Plot, Flight Path Angle vs Time



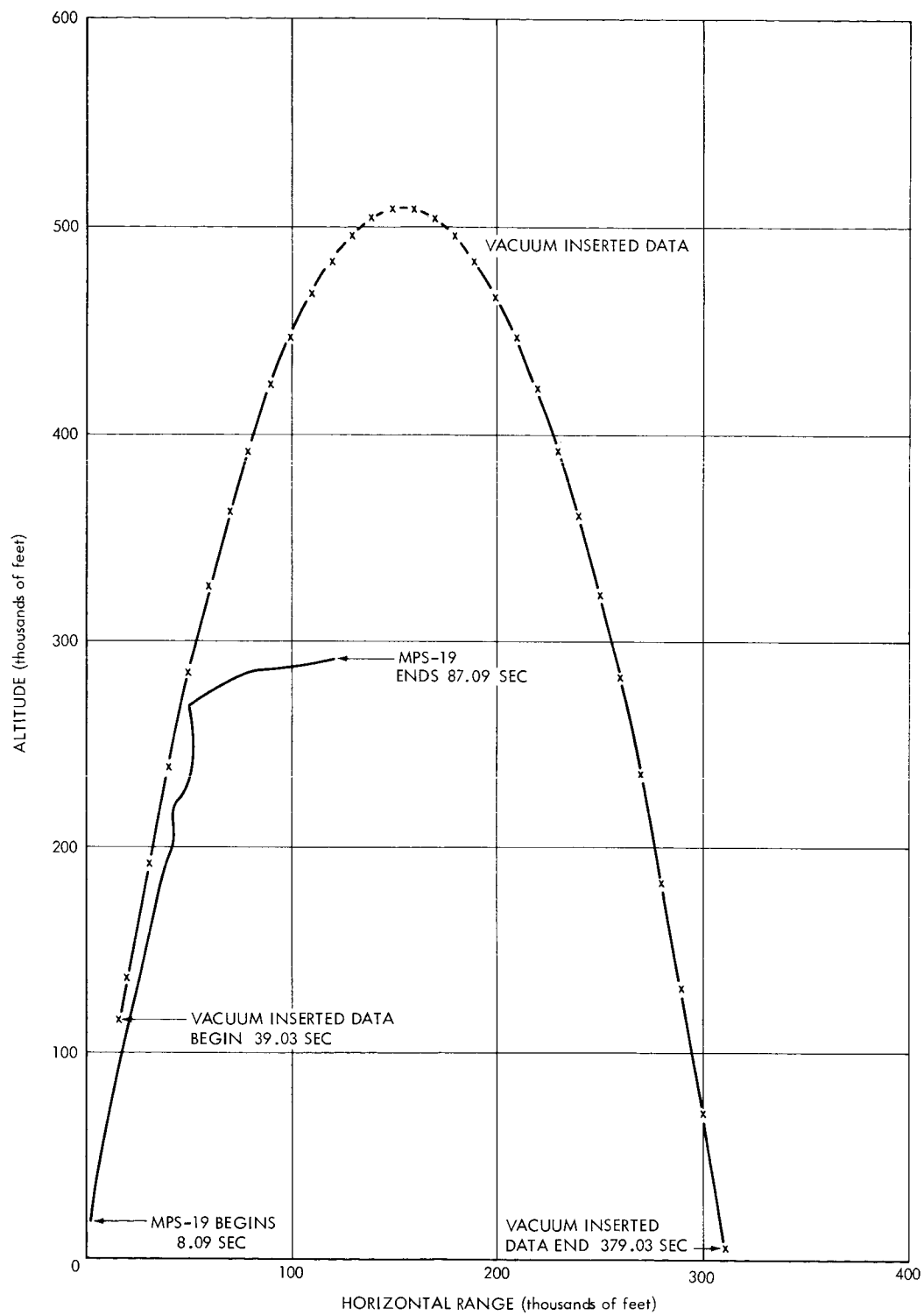


Figure 254. 14.185 UE Radar Plot, Altitude vs Horizontal Range

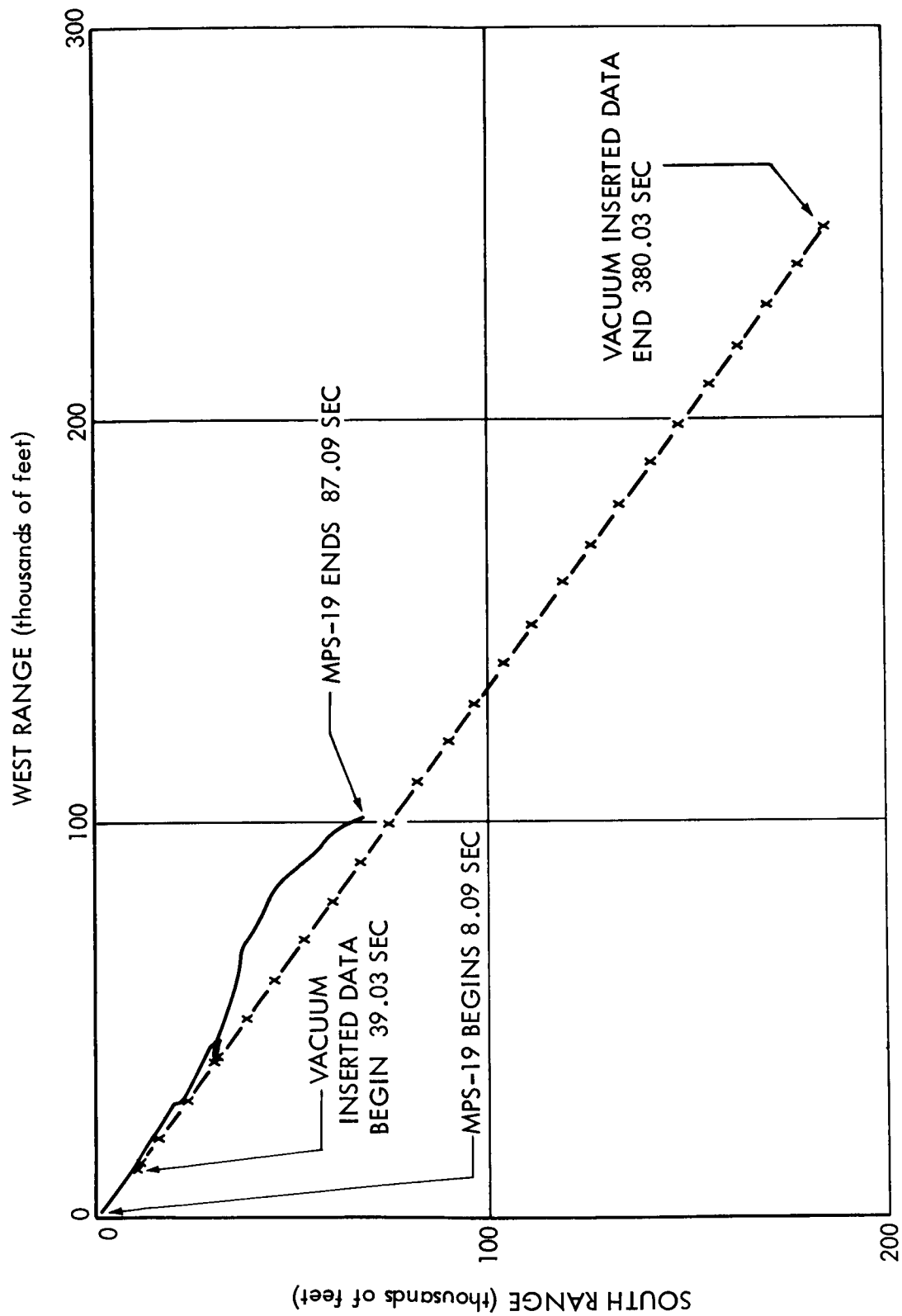


Figure 255. 14.185 UE Radar Plot, South Range vs West Range

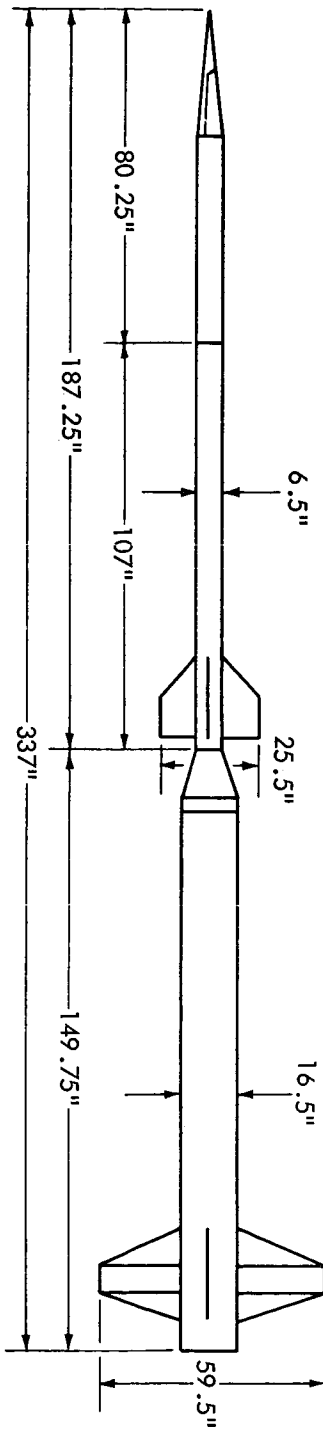


Figure 256. 14.186 UE Sketch

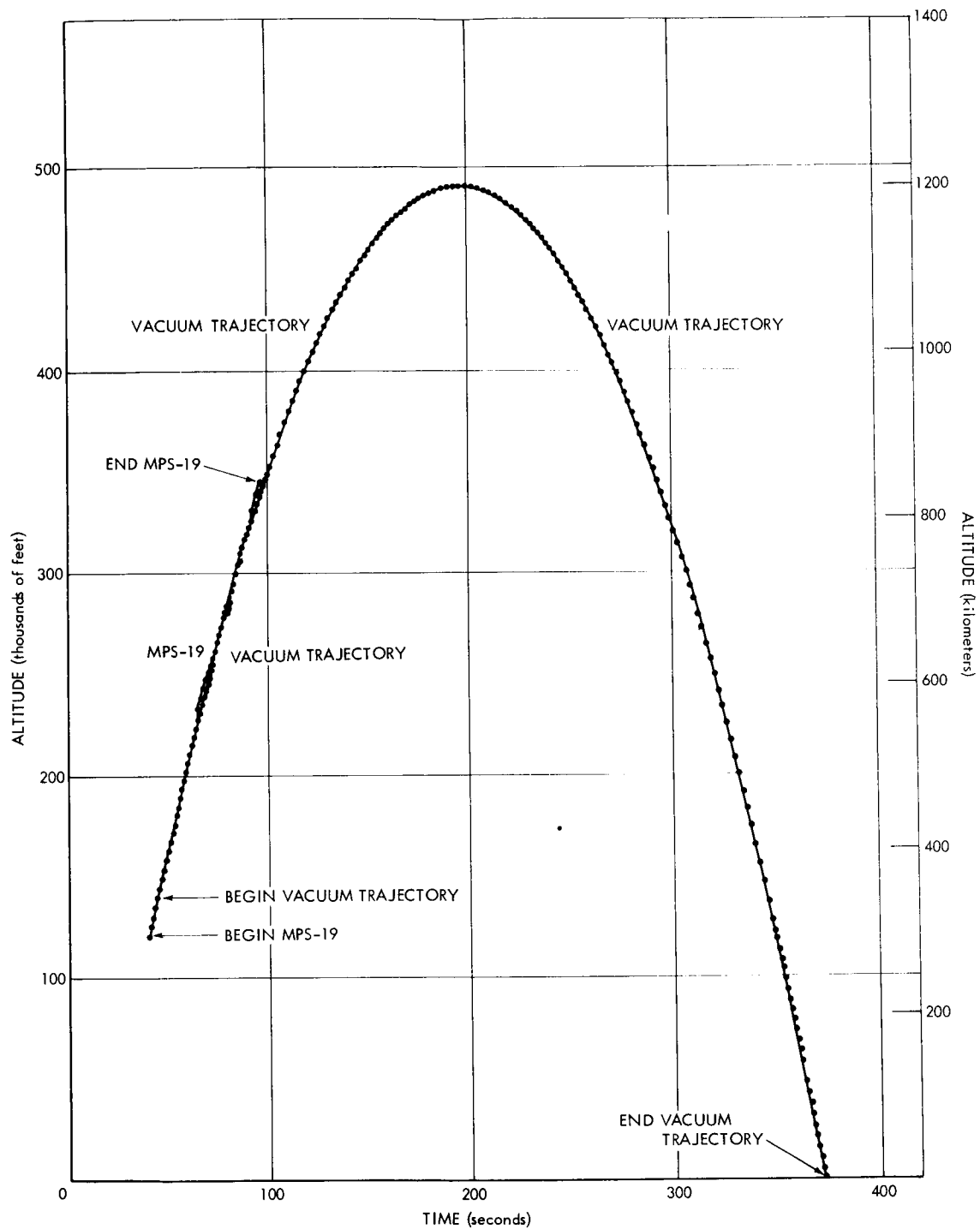


Figure 257. 14.186 UE Radar Plot, Altitude vs Time

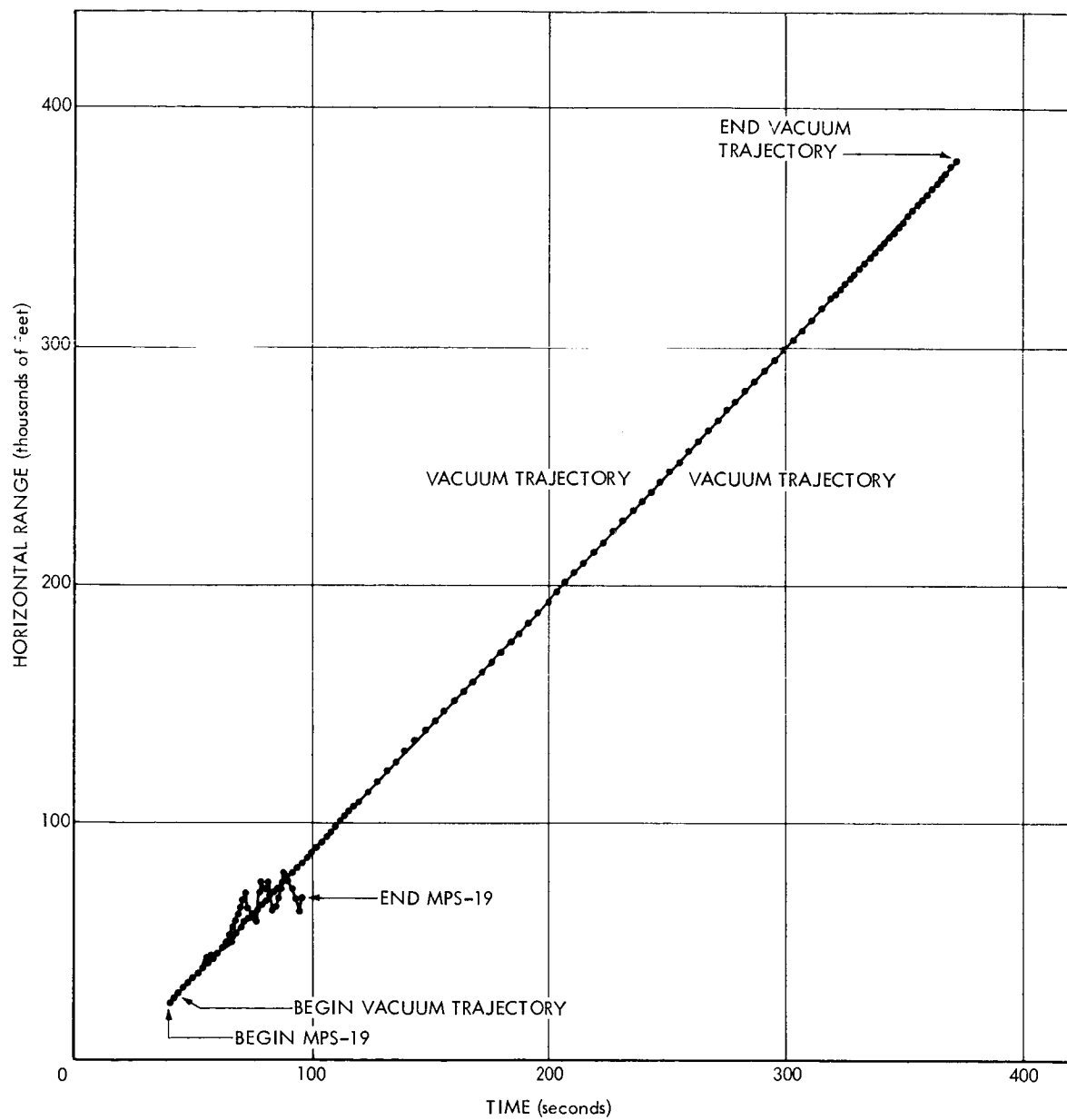


Figure 258. 14.186 UE Radar Plot, Horizontal Range vs Time

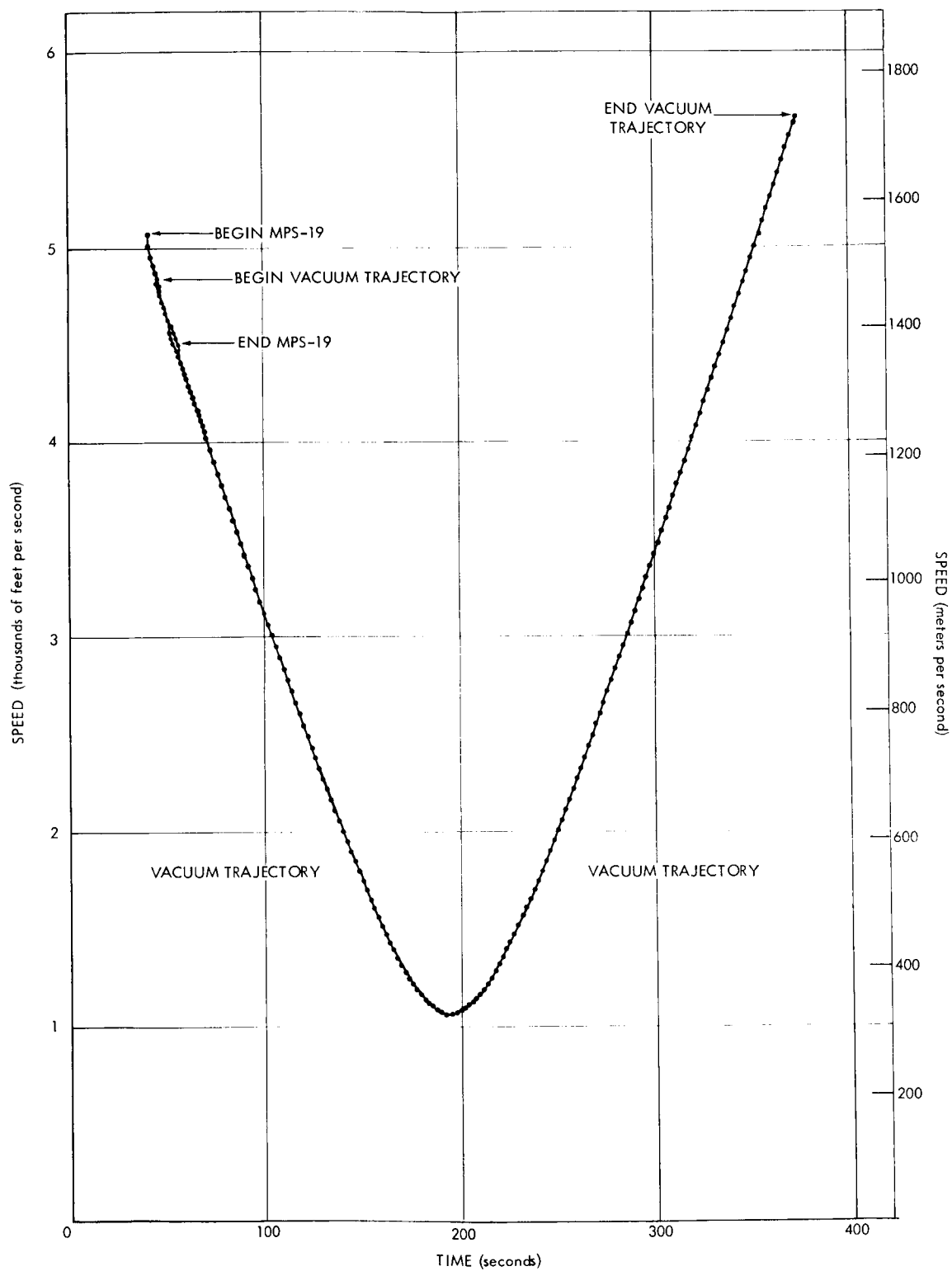


Figure 259. 14.186 UE Radar Plot, Speed vs Time

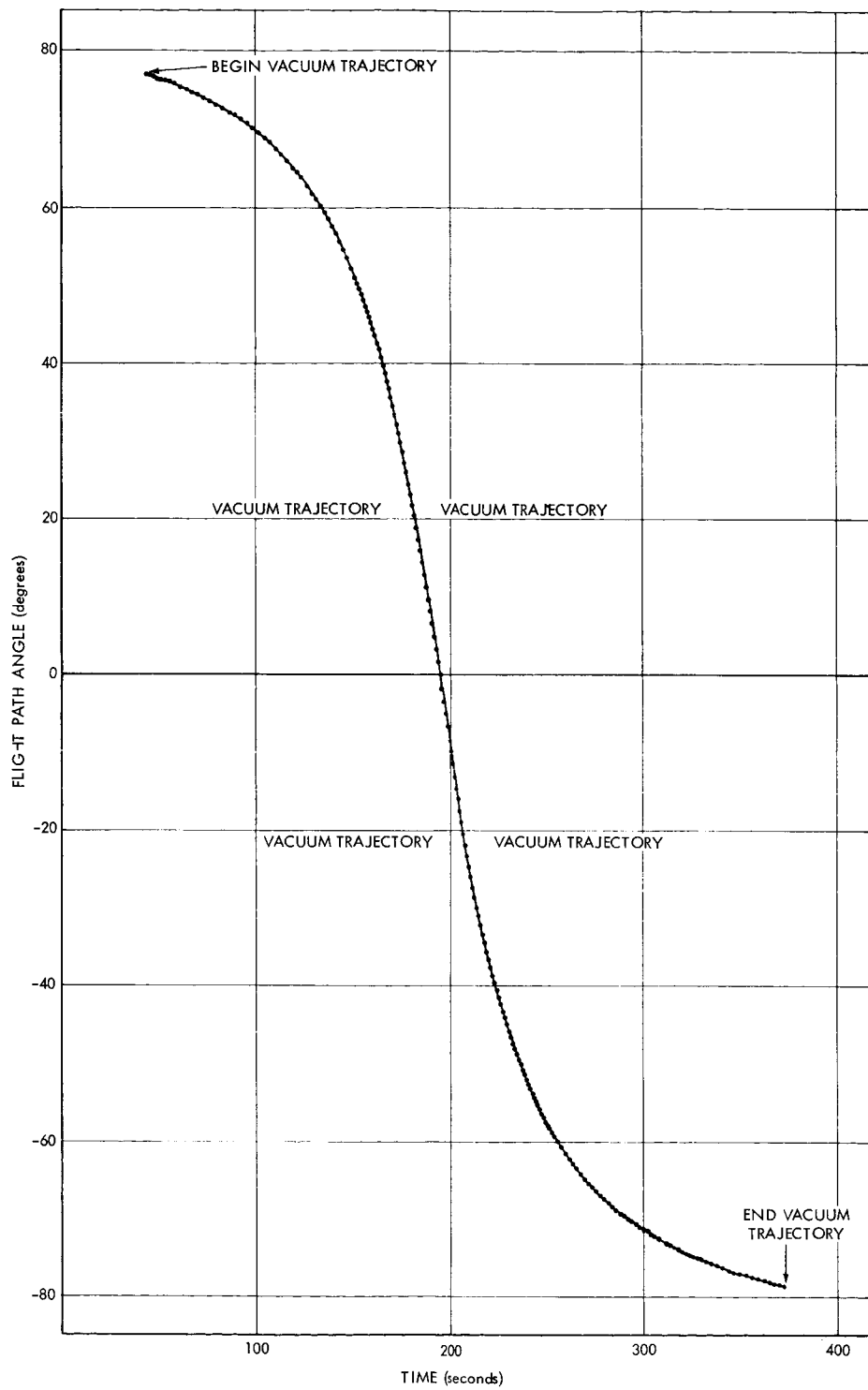


Figure 260. 14.186 UE Radar Plot, Flight Path Angle vs Time

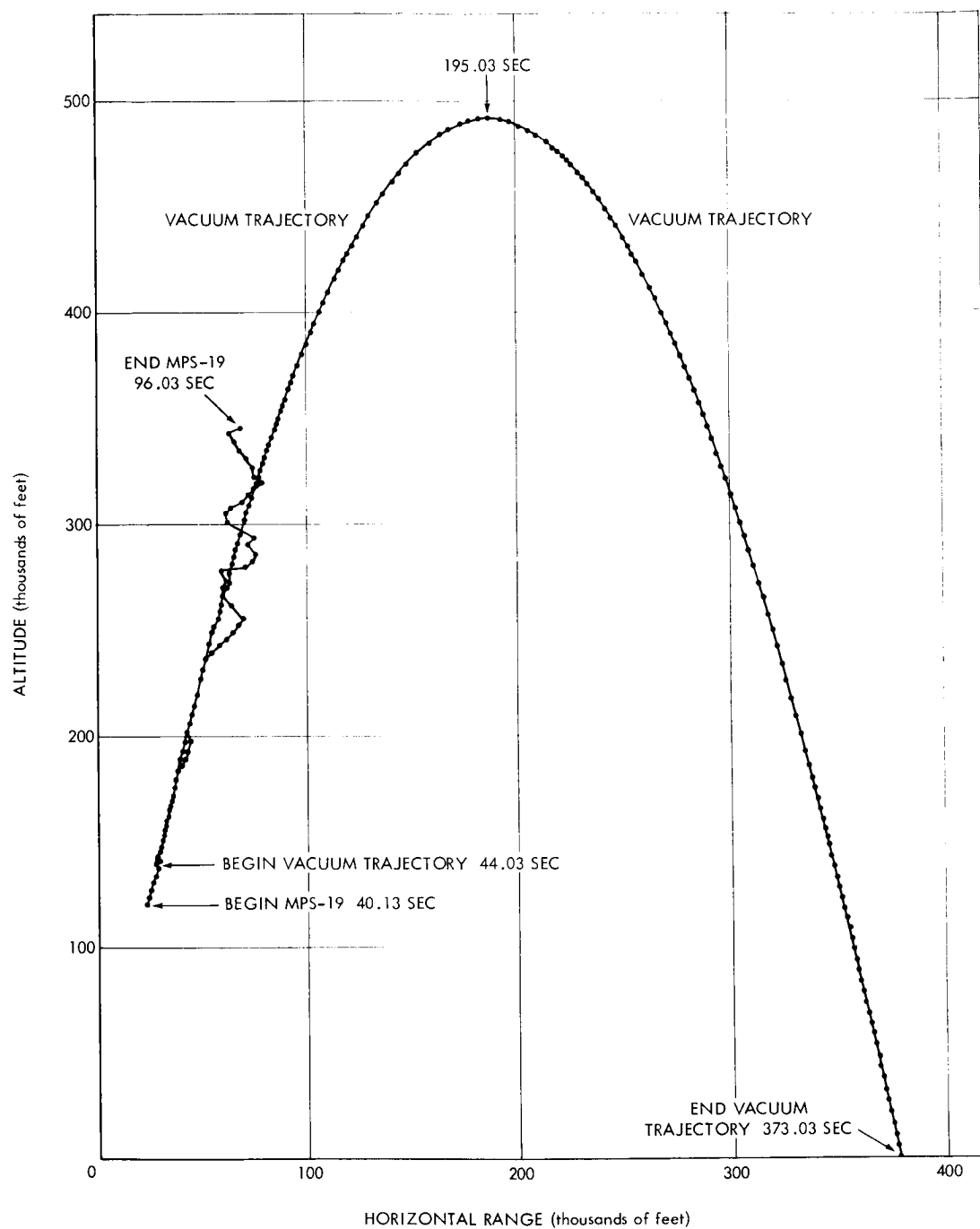


Figure 261. 14.186 UE Radar Plot, Altitude vs Horizontal Range



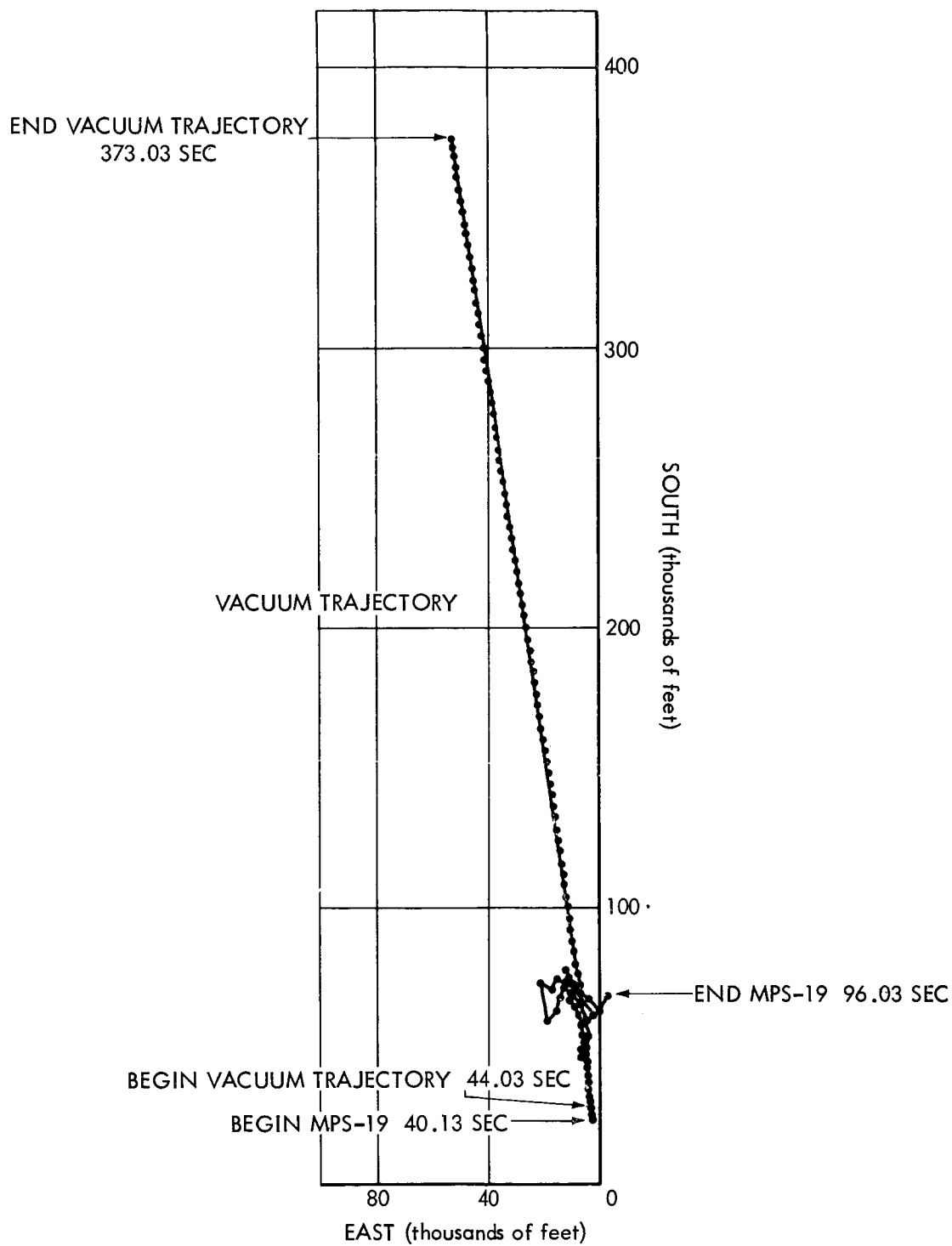


Figure 262. 14.186 UE Radar Plot, South Range vs East Range

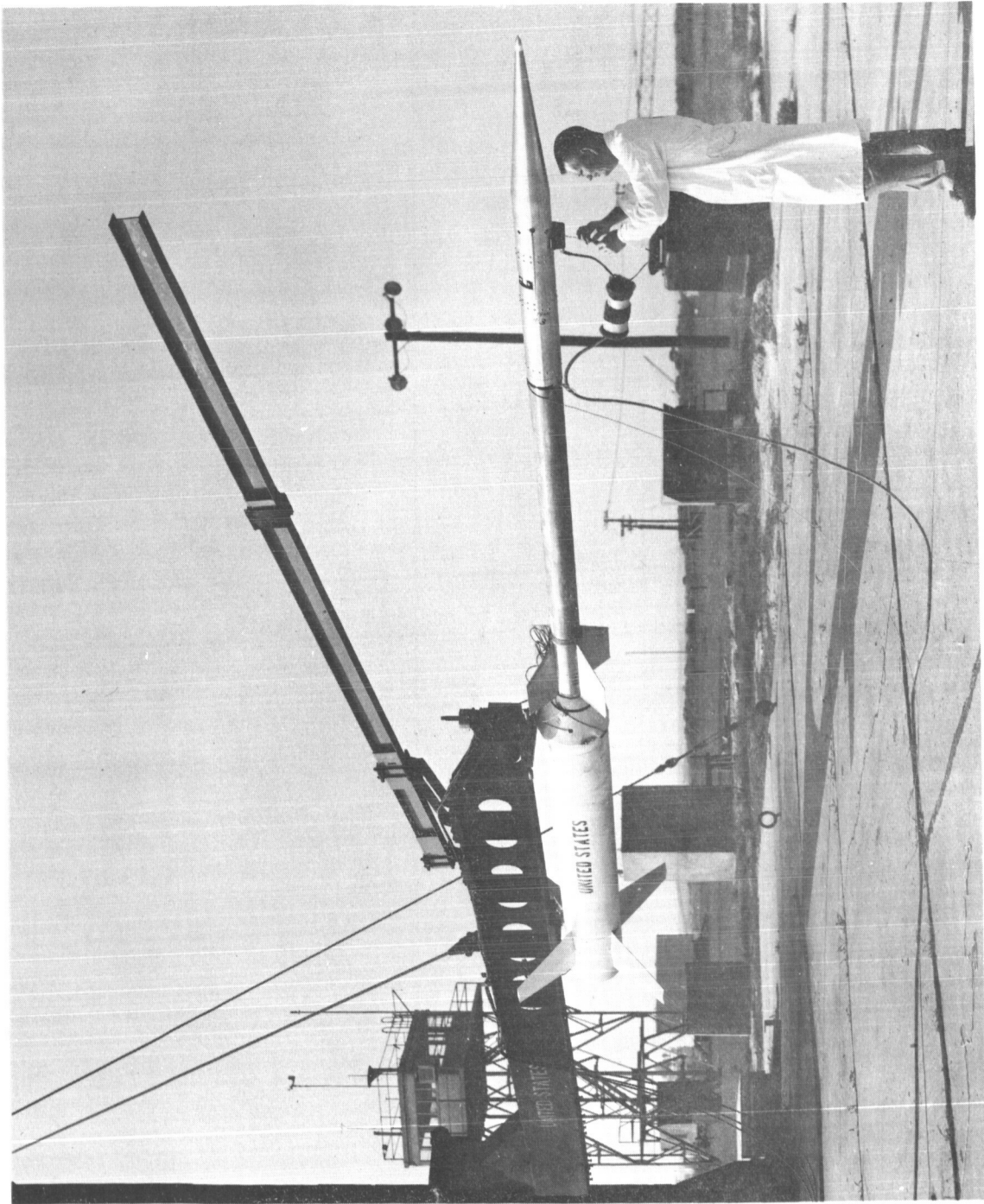


Figure 263. 14.201 CA Photograph

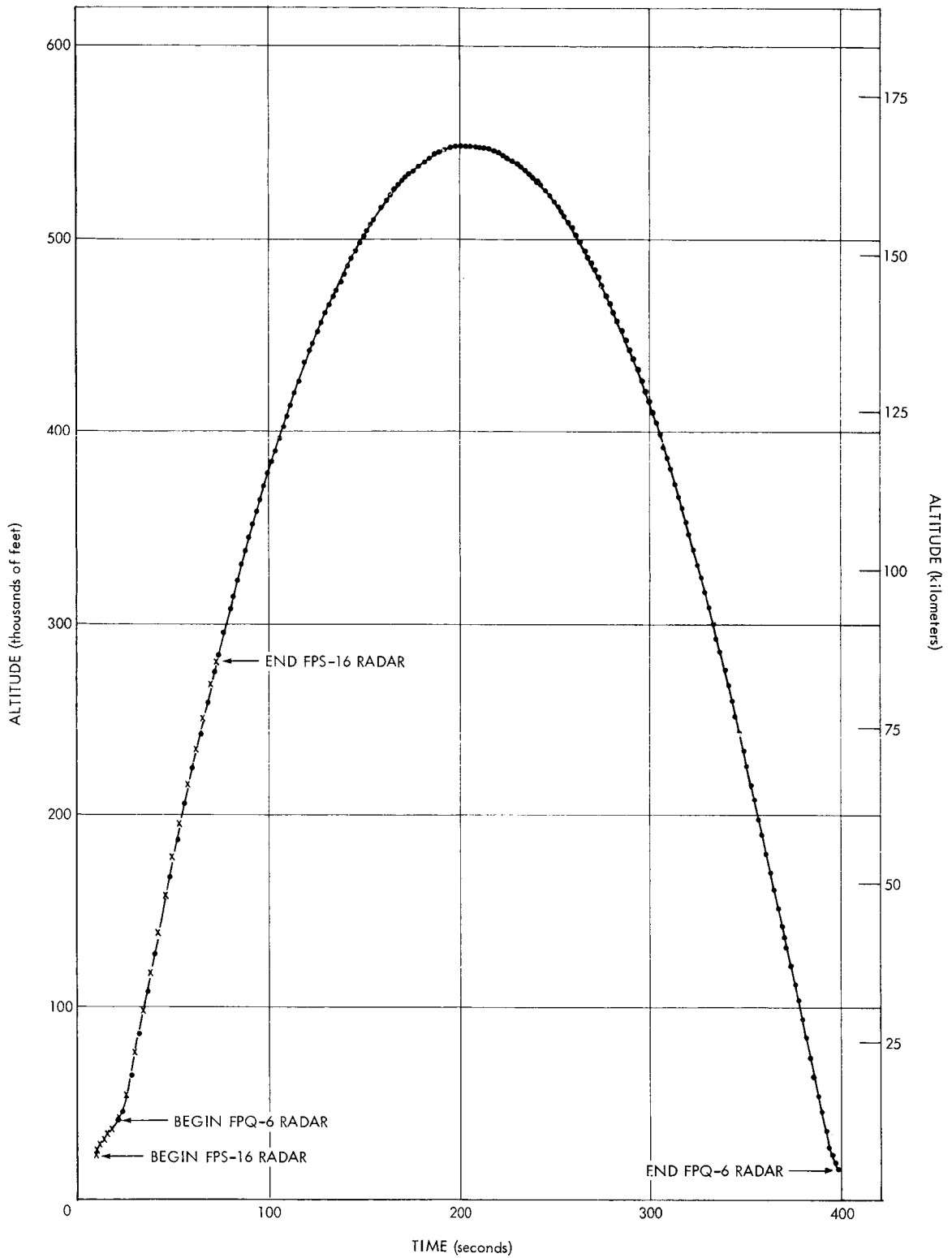


Figure 264. 14.201 CA Radar Plot, Altitude vs Time

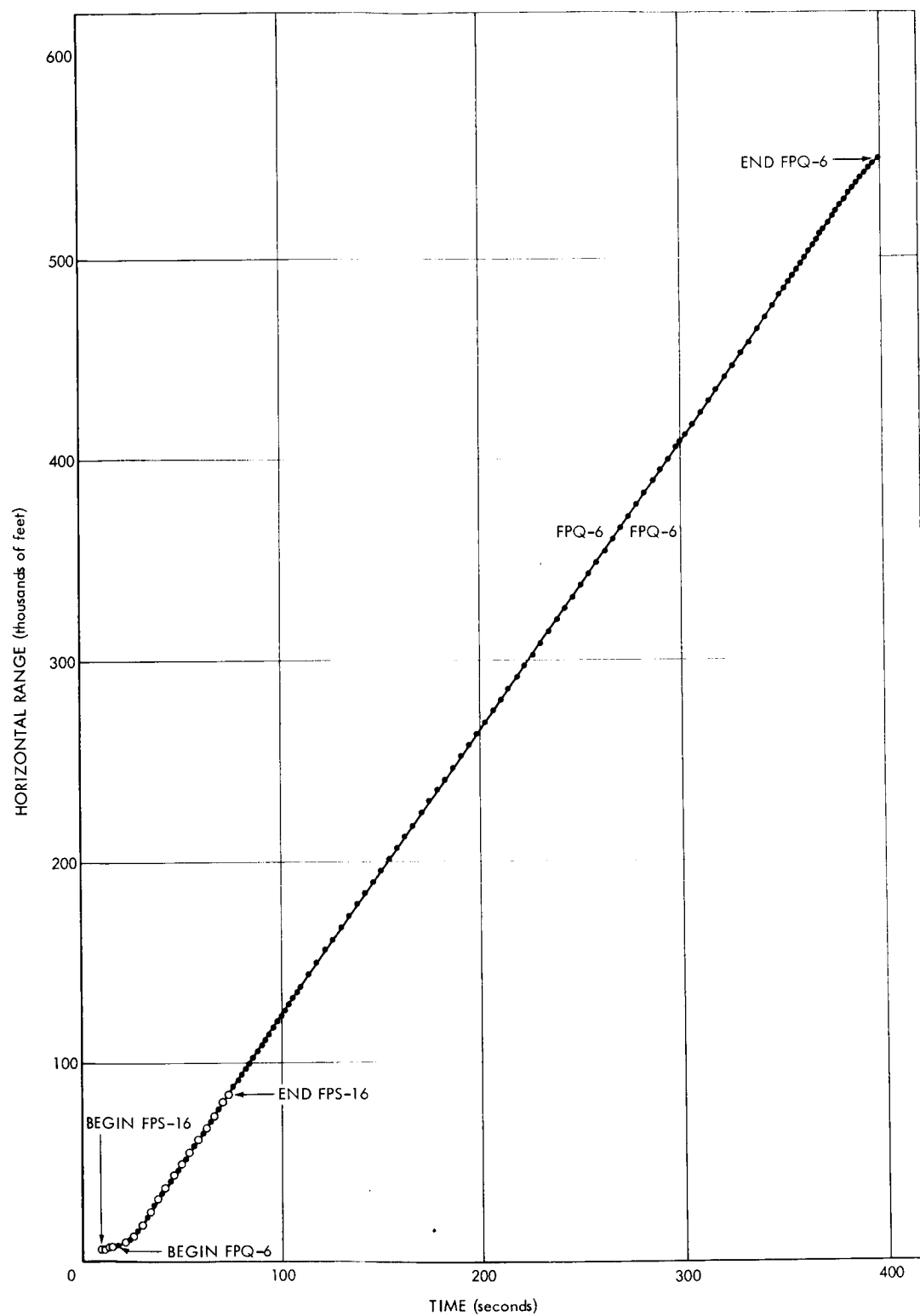


Figure 265. 14.201 CA Radar Plot, Horizontal Range vs Time

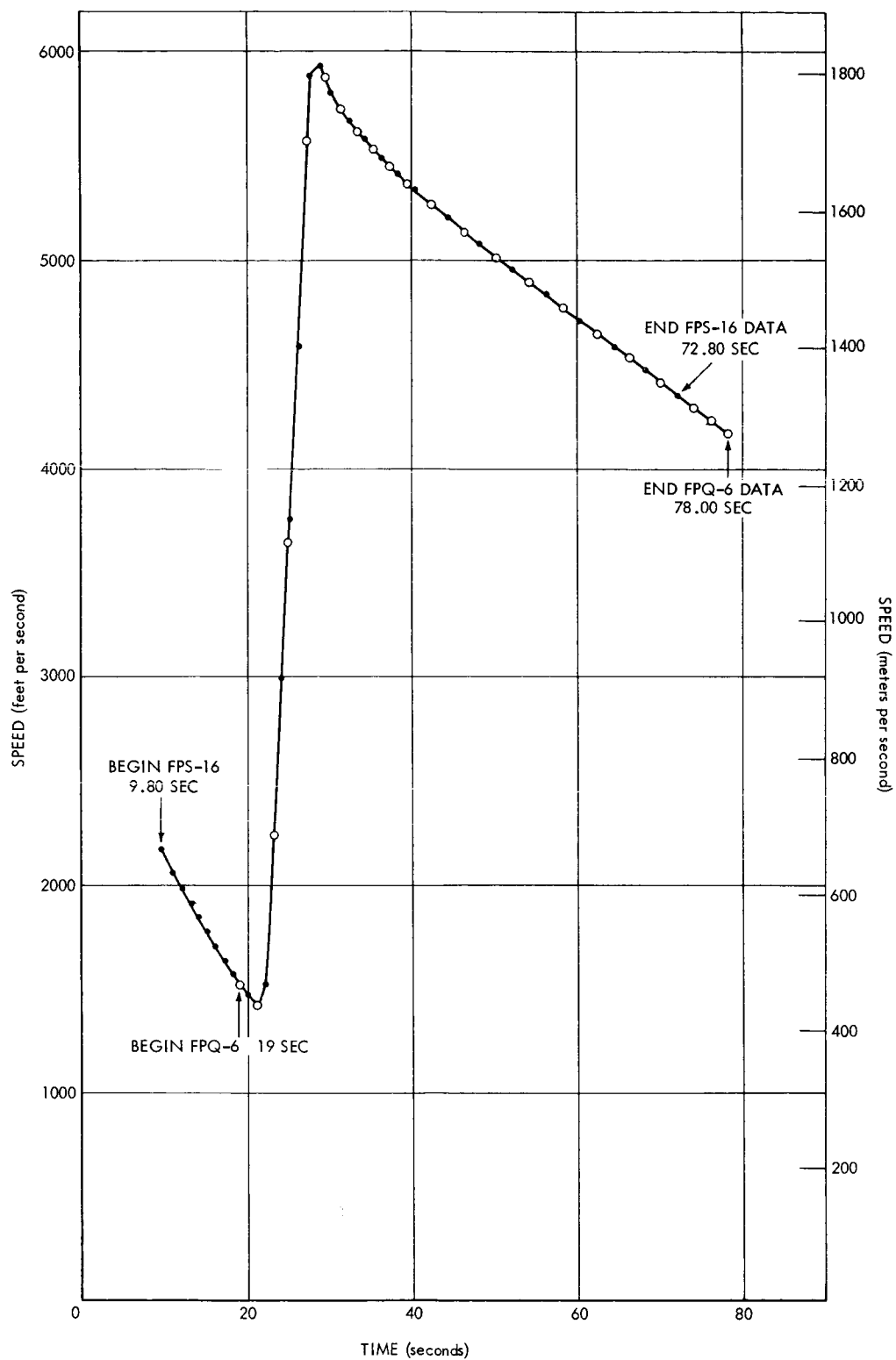


Figure 266. 14.201 CA Radar Plot, Speed vs Time

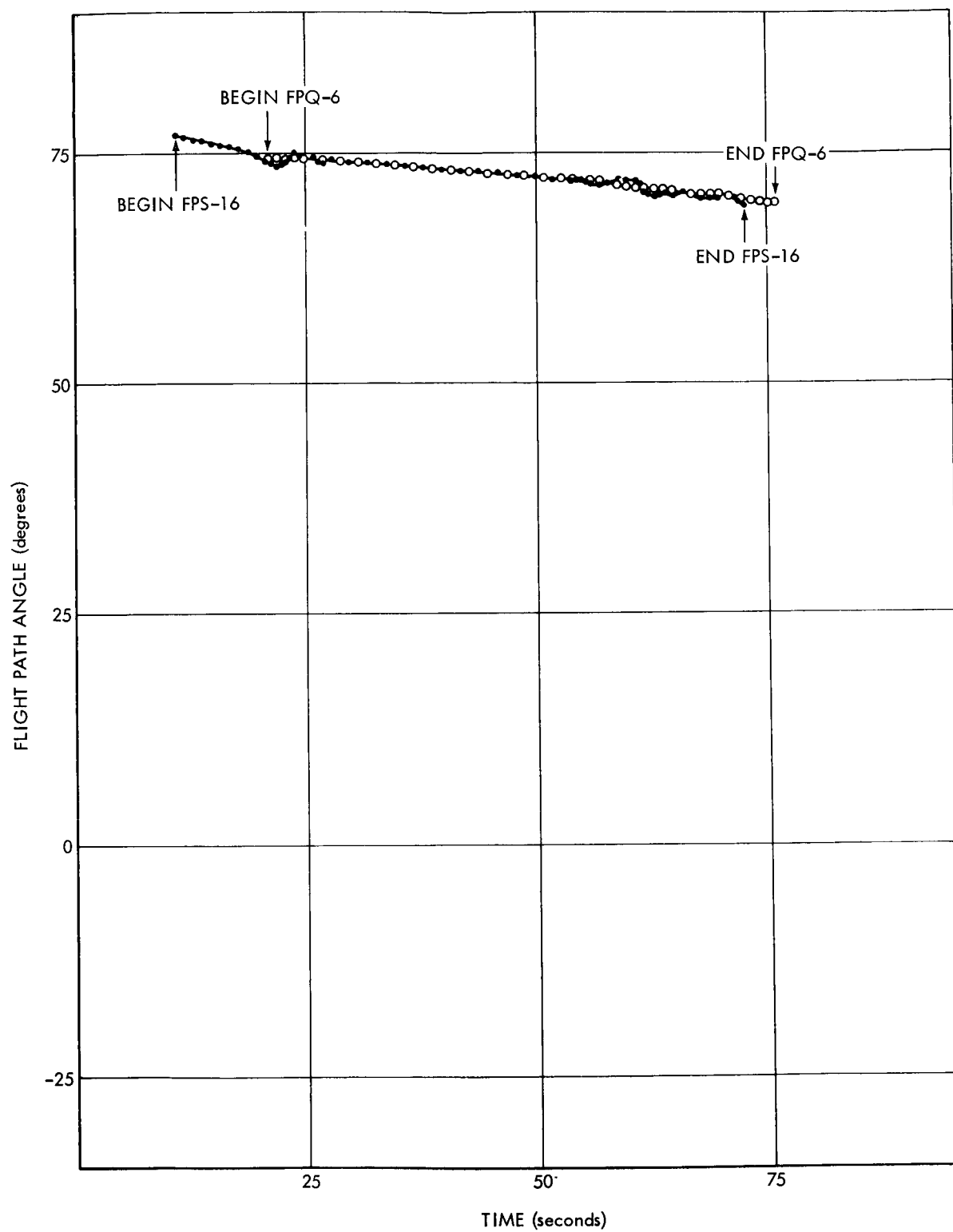


Figure 267. 14.201 CA Radar Plot, Flight Path Angle vs Time

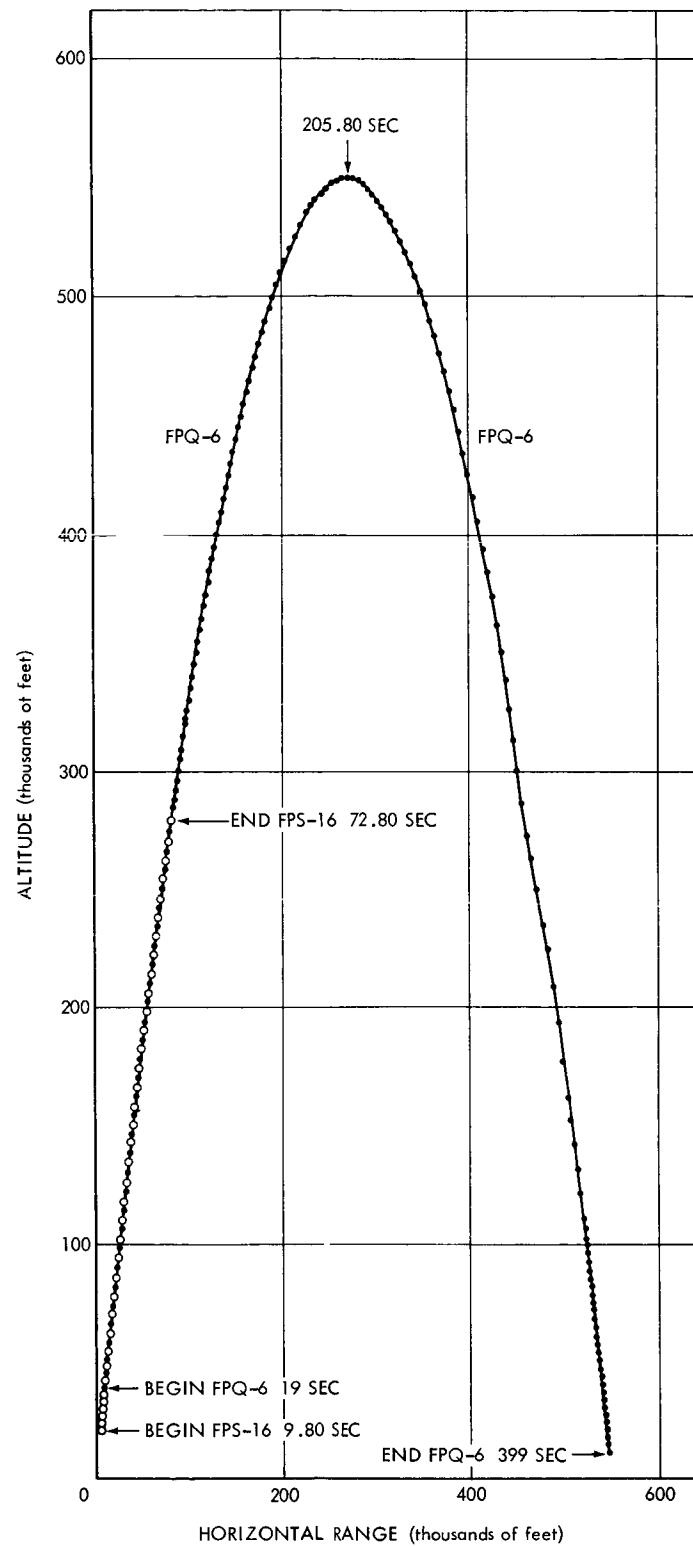


Figure 268. 14.201 CA Radar Plot, Altitude vs Horizontal Range

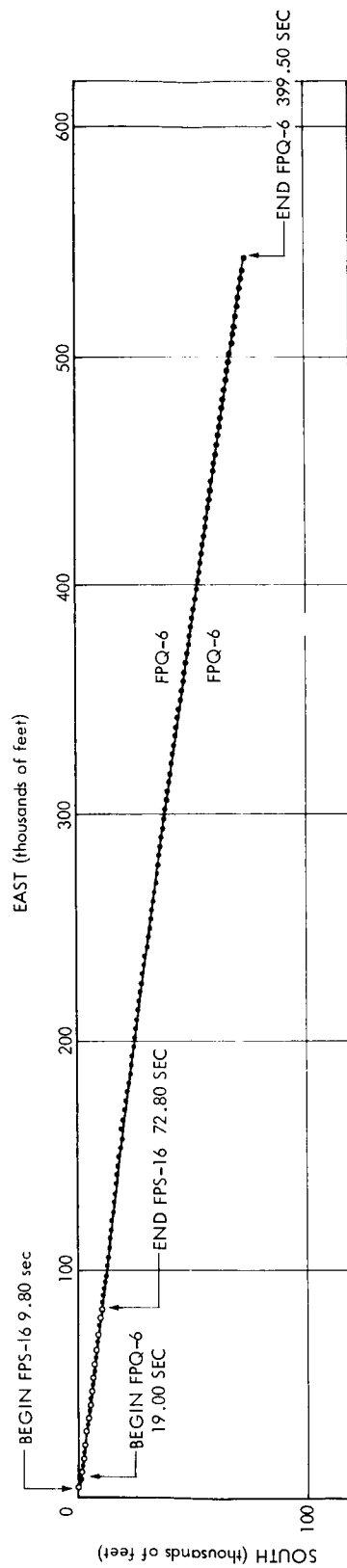


Figure 269. 14.201 CA Radar Plot, South Range vs East Range



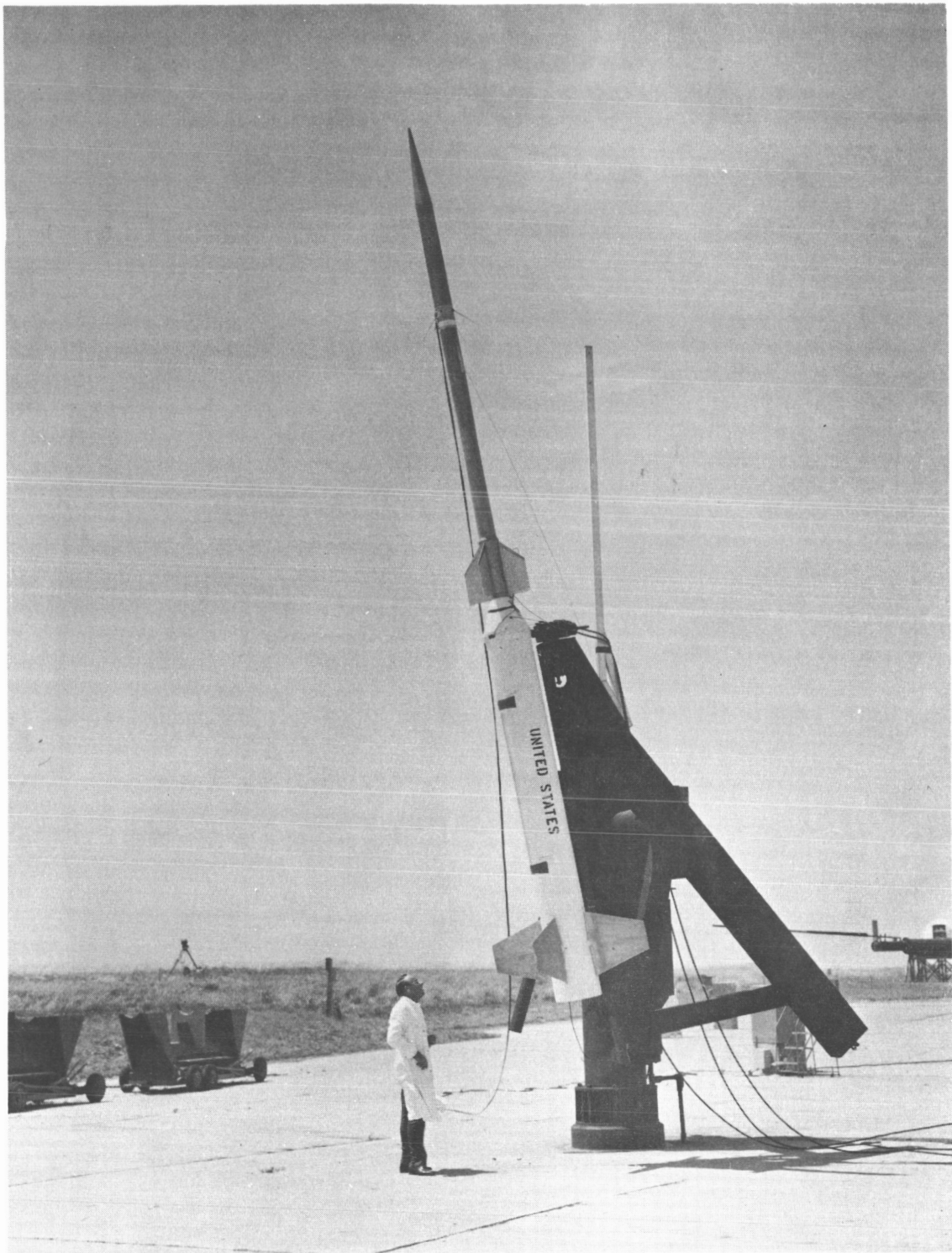


Figure 270. 14.215 AI Photograph

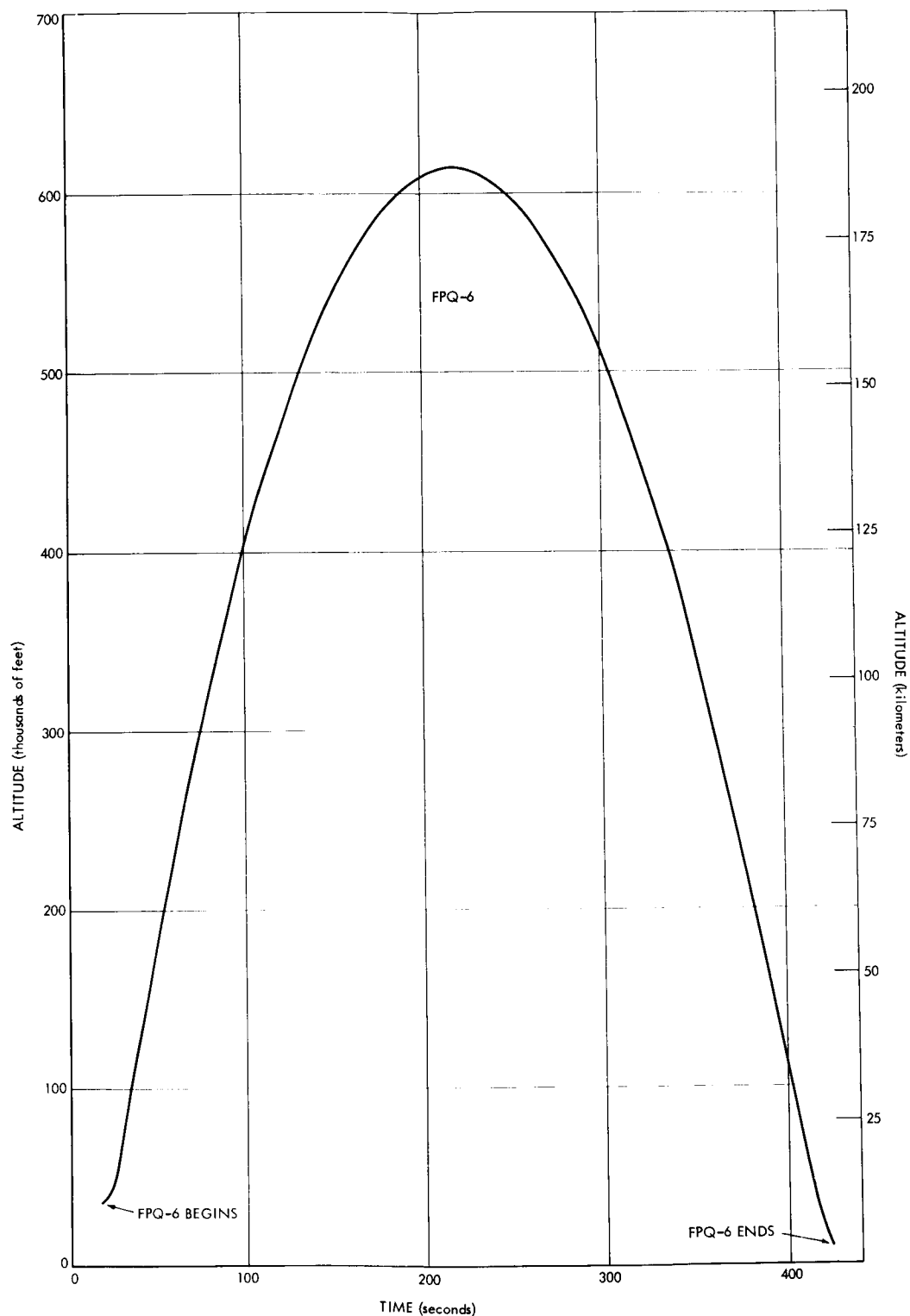


Figure 271. 14.215 AI Radar Plot, Altitude vs Time

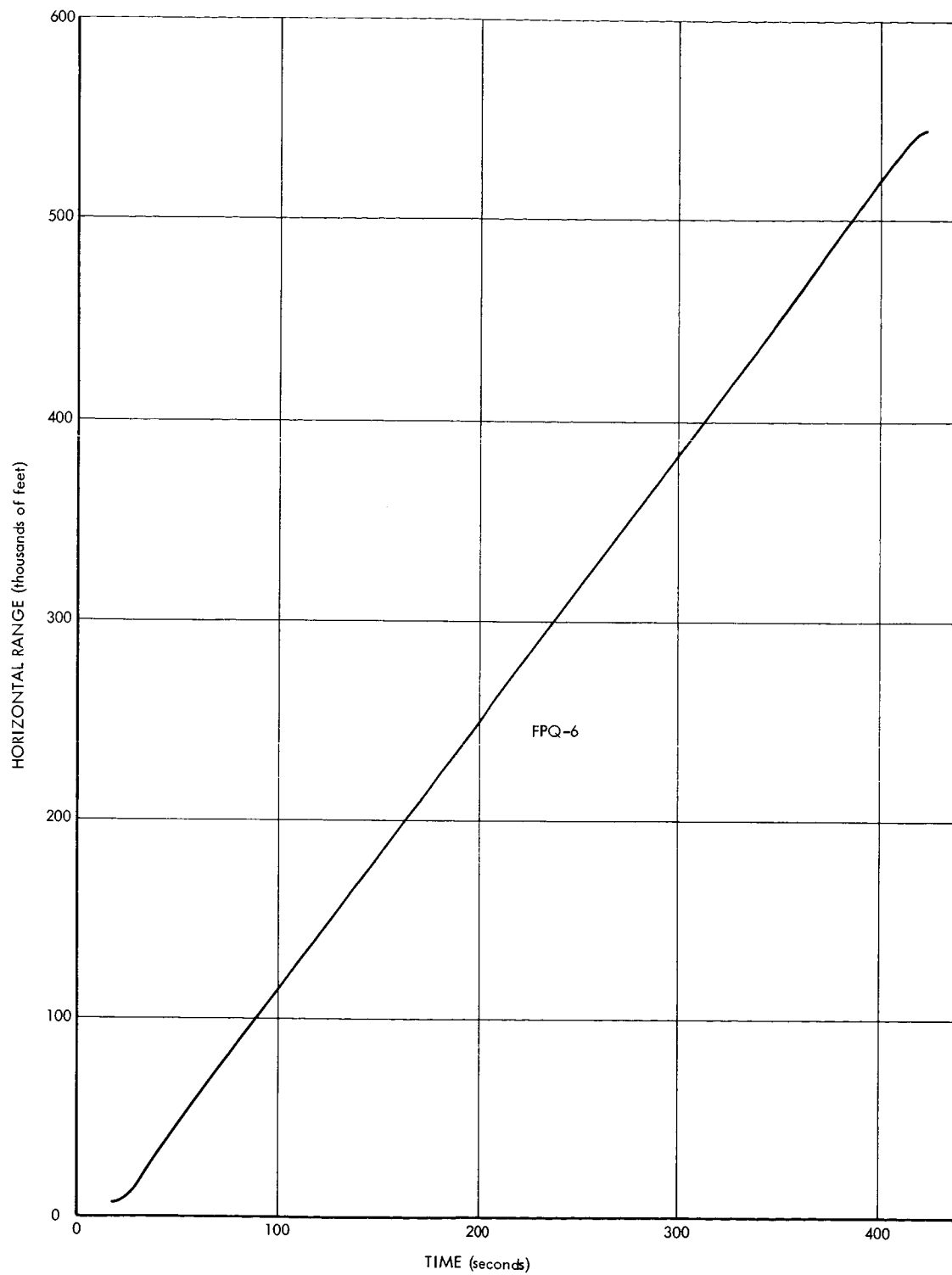


Figure 272. 14.215 AI Radar Plot, Horizontal Range vs Time

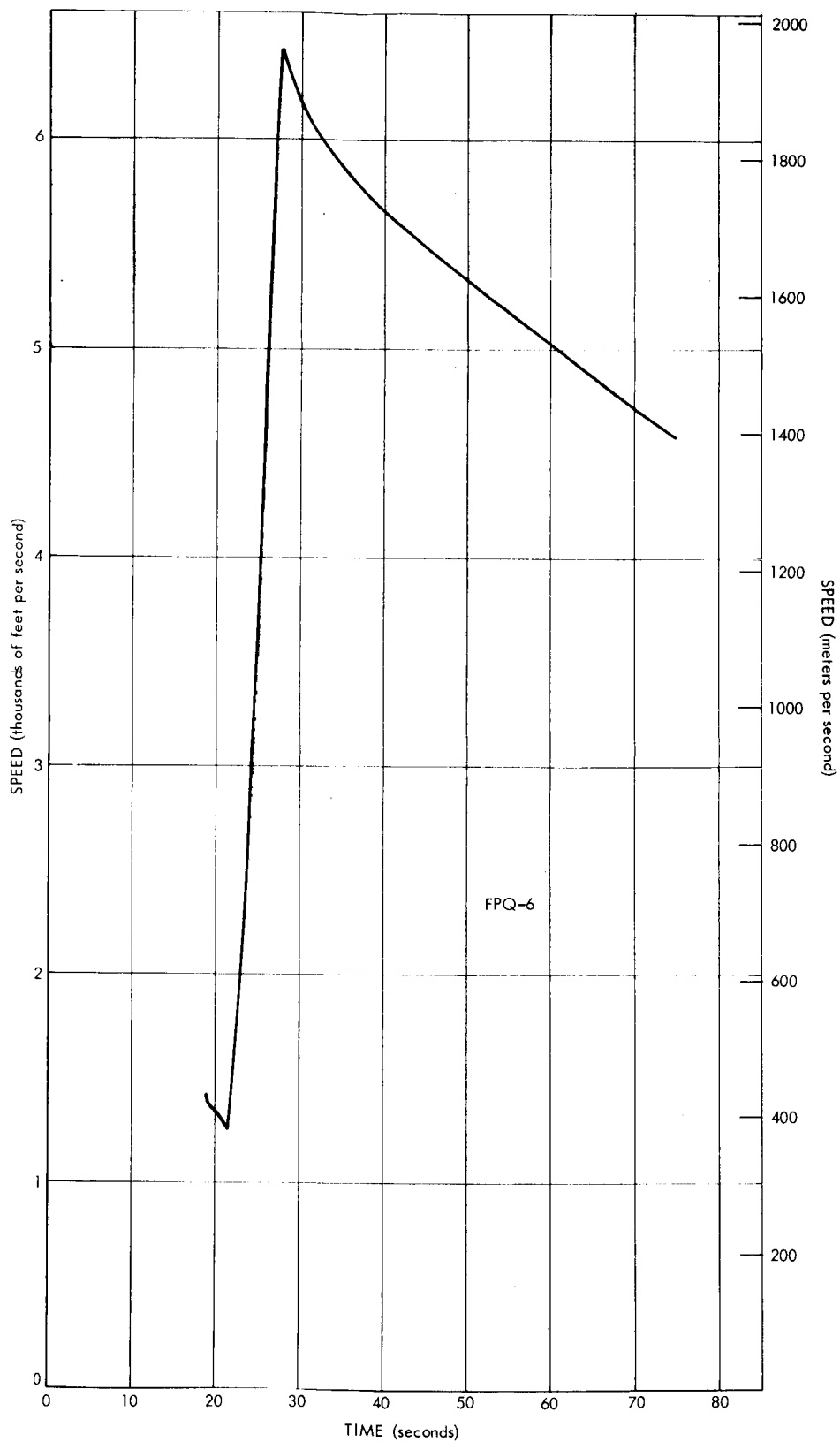


Figure 273. 14.215 AI Radar Plot, Speed vs Time

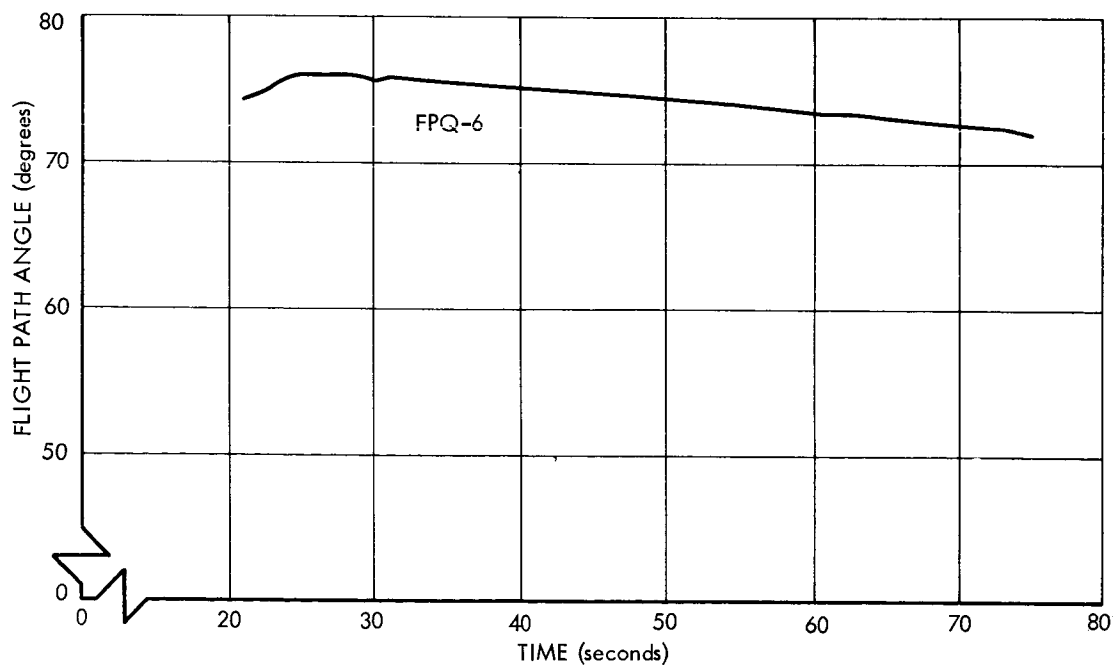


Figure 274. 14.215 AI Radar Plot, Flight Path Angle vs Time

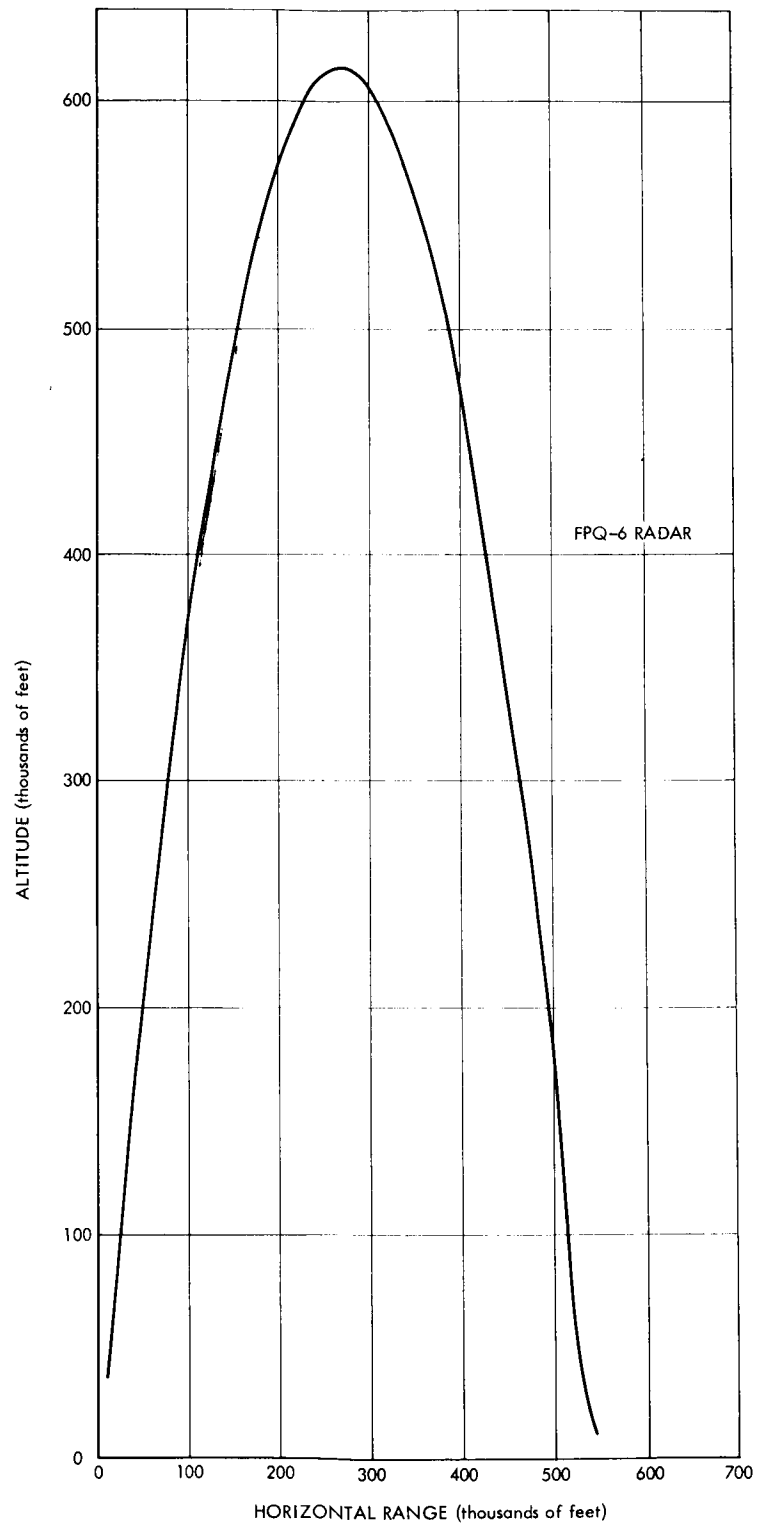


Figure 275. 14.215 AI Radar Plot, Altitude vs Horizontal Range

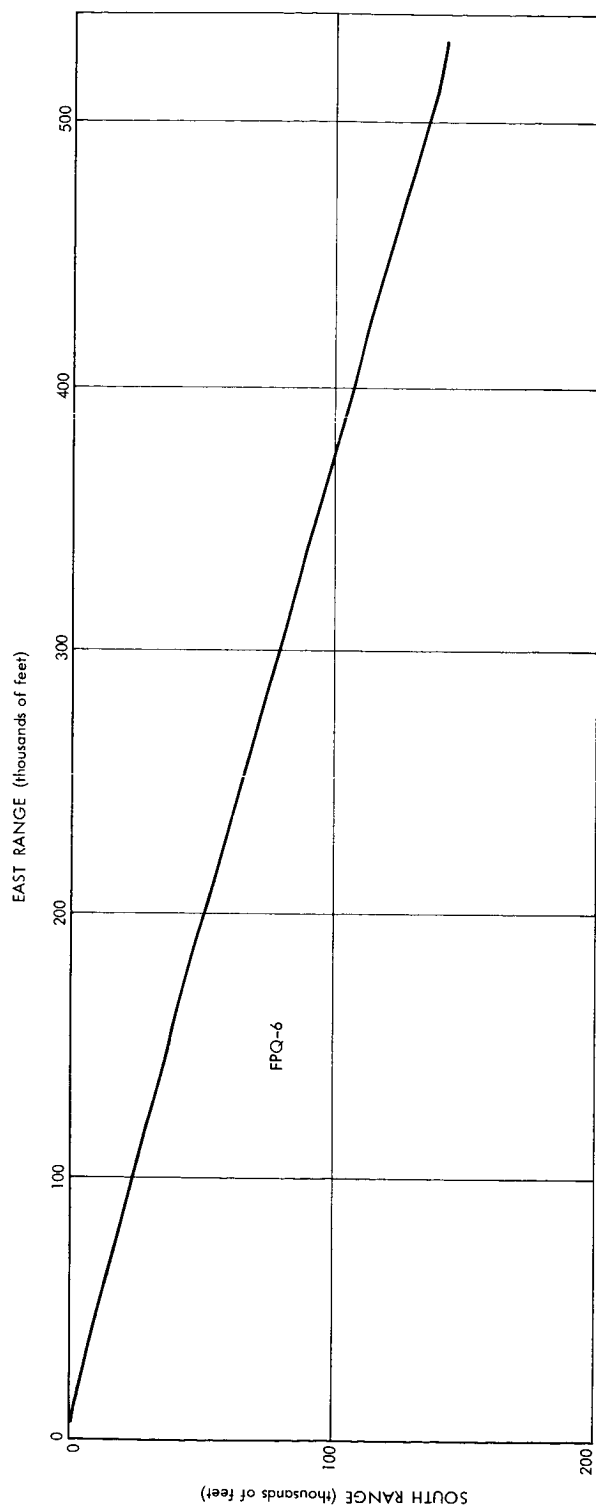


Figure 276. 14.215 AI Radar Plot, South Range vs East Range

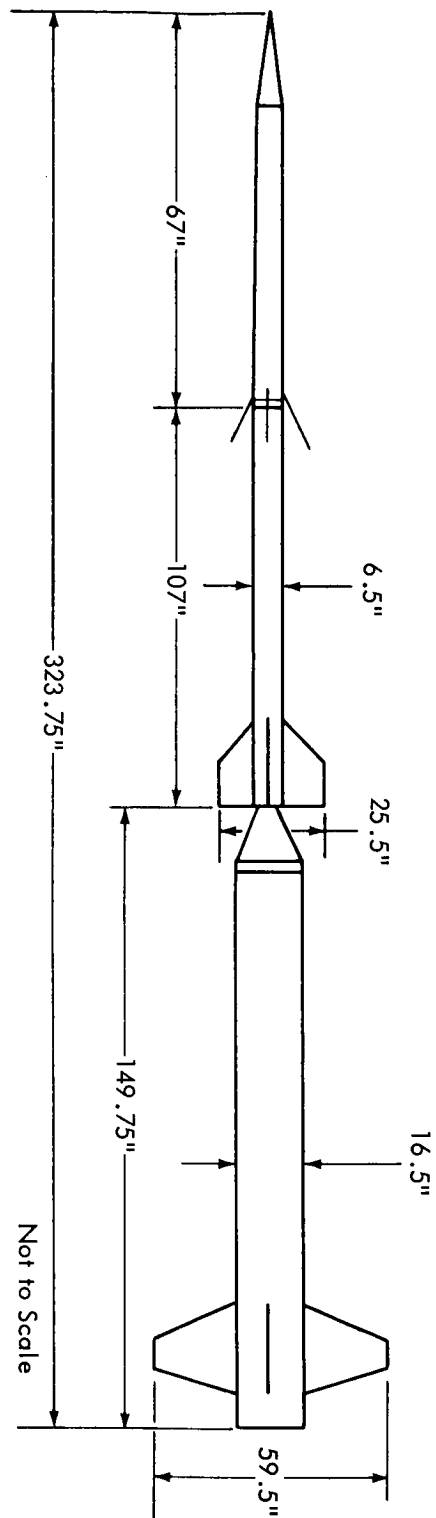


Figure 277. 14.228 UI Sketch



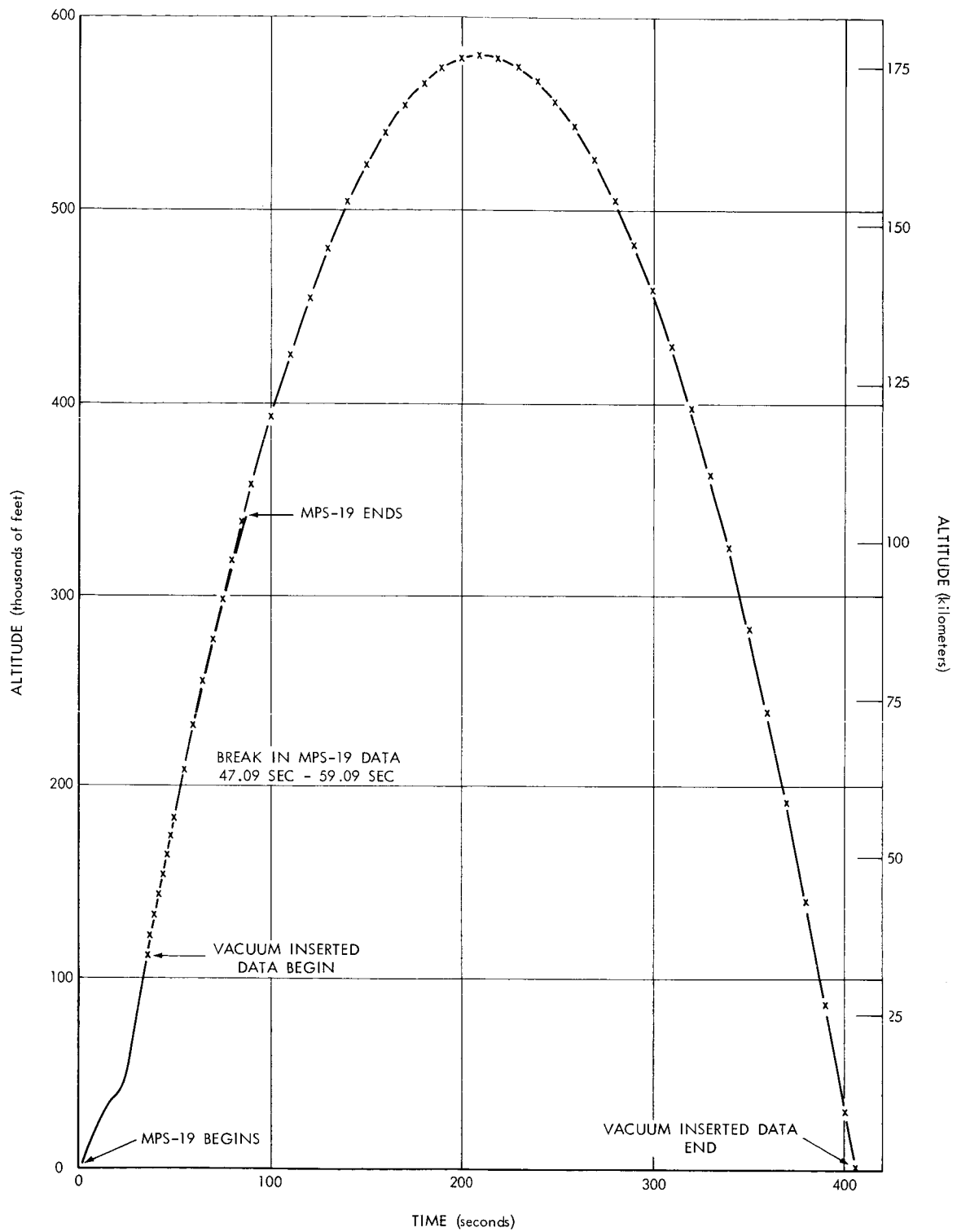


Figure 278. 14.228 UI Radar Plot, Altitude vs Time

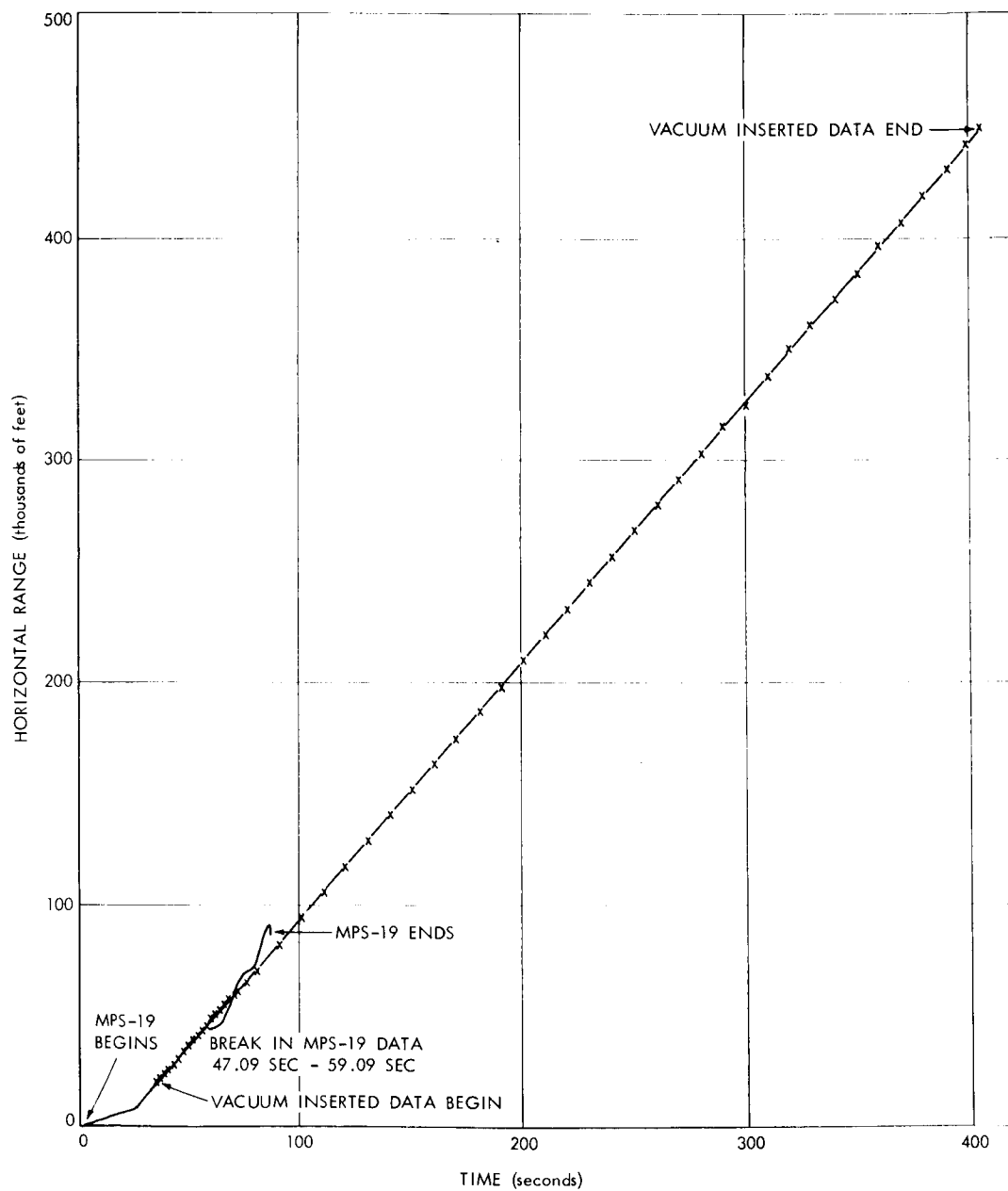


Figure 279. 14.228 UI Radar Plot, Horizontal Range vs Time

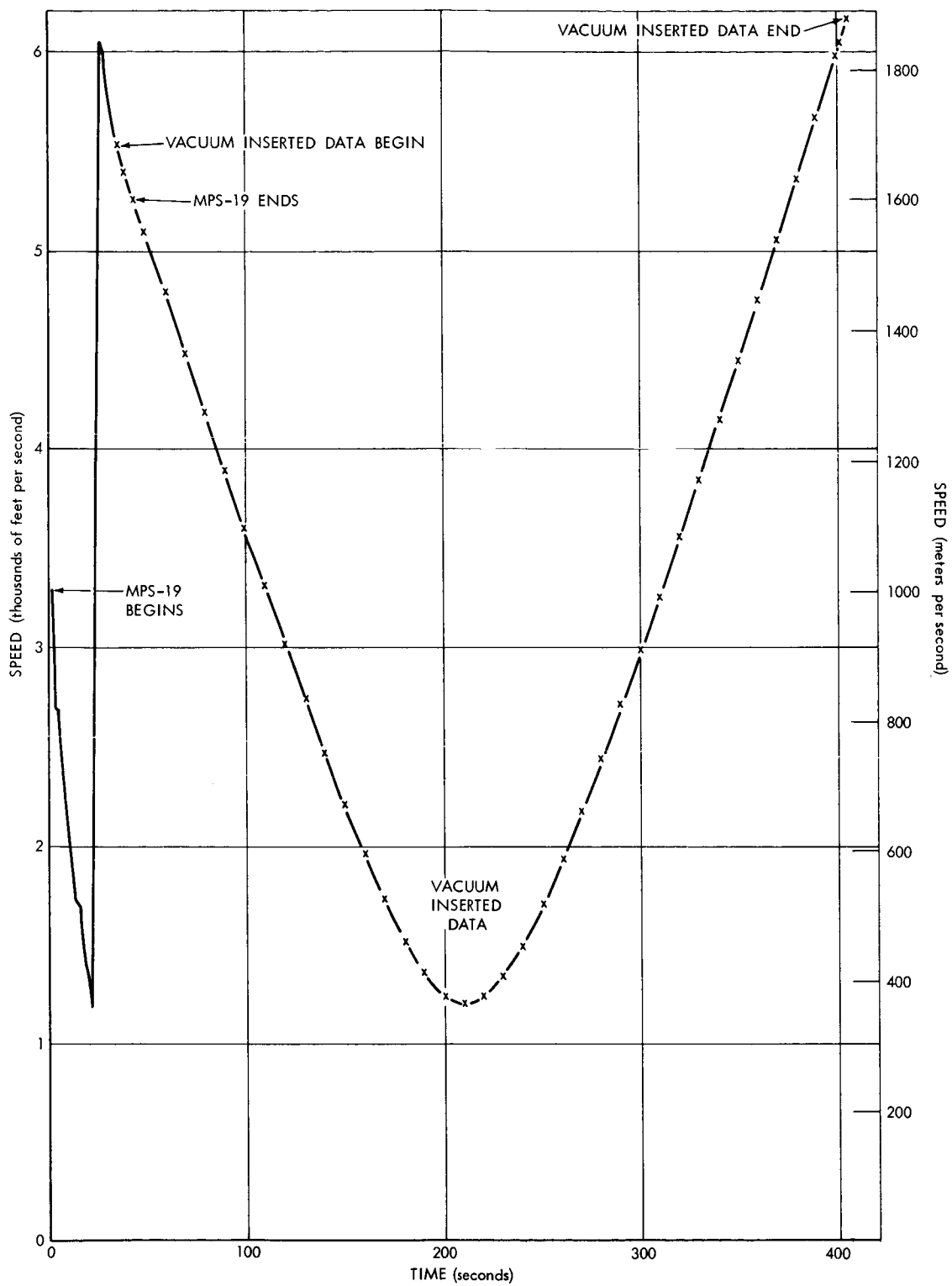


Figure 280. 14.228 UI Radar Plot, Speed vs Time

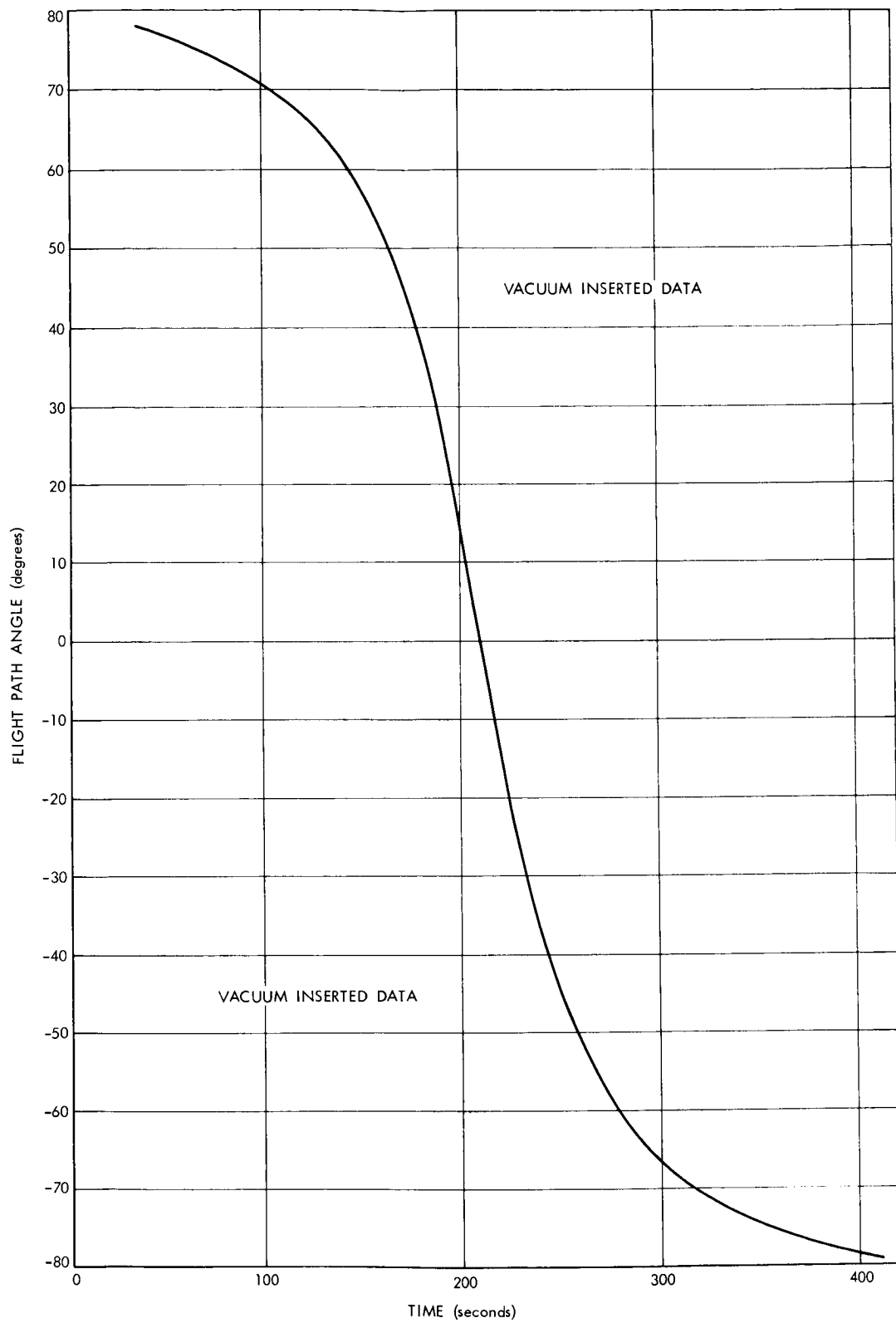


Figure 281. 14.228 UI Radar Plot, Flight Path Angle vs Time

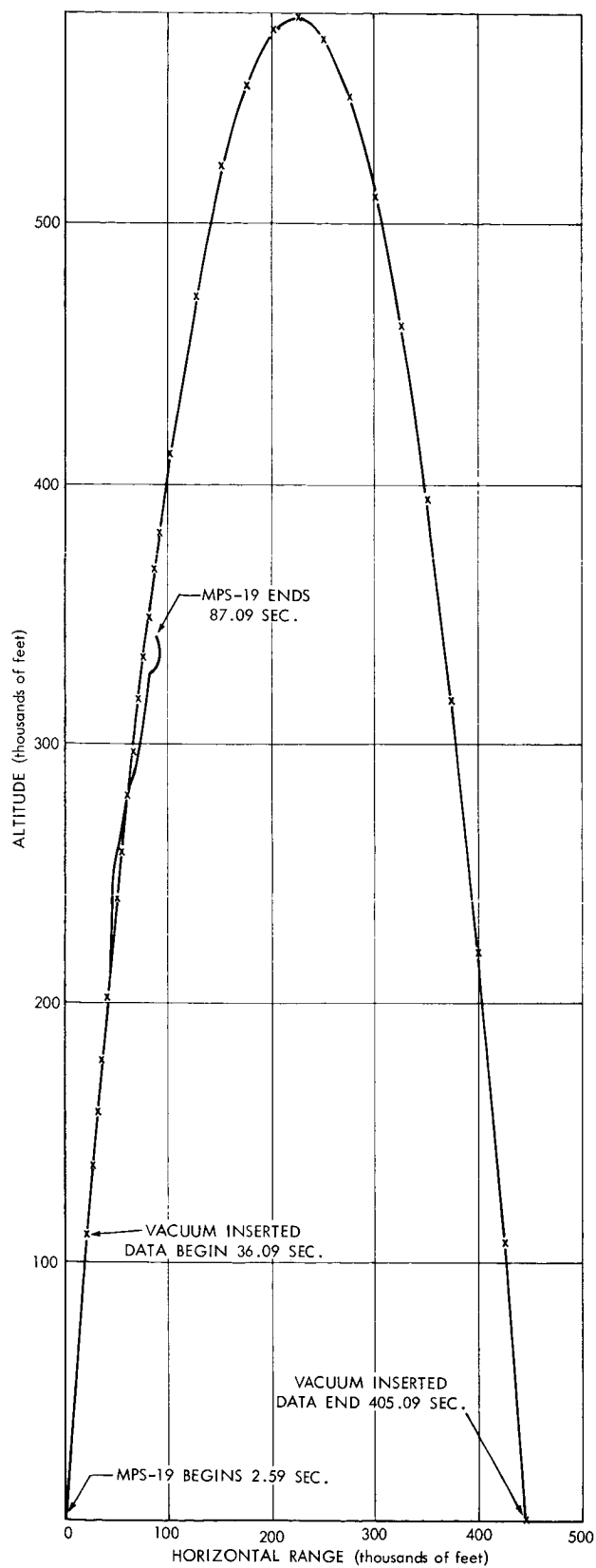


Figure 282. 14.228 UI Radar Plot, Altitude vs Horizontal Range

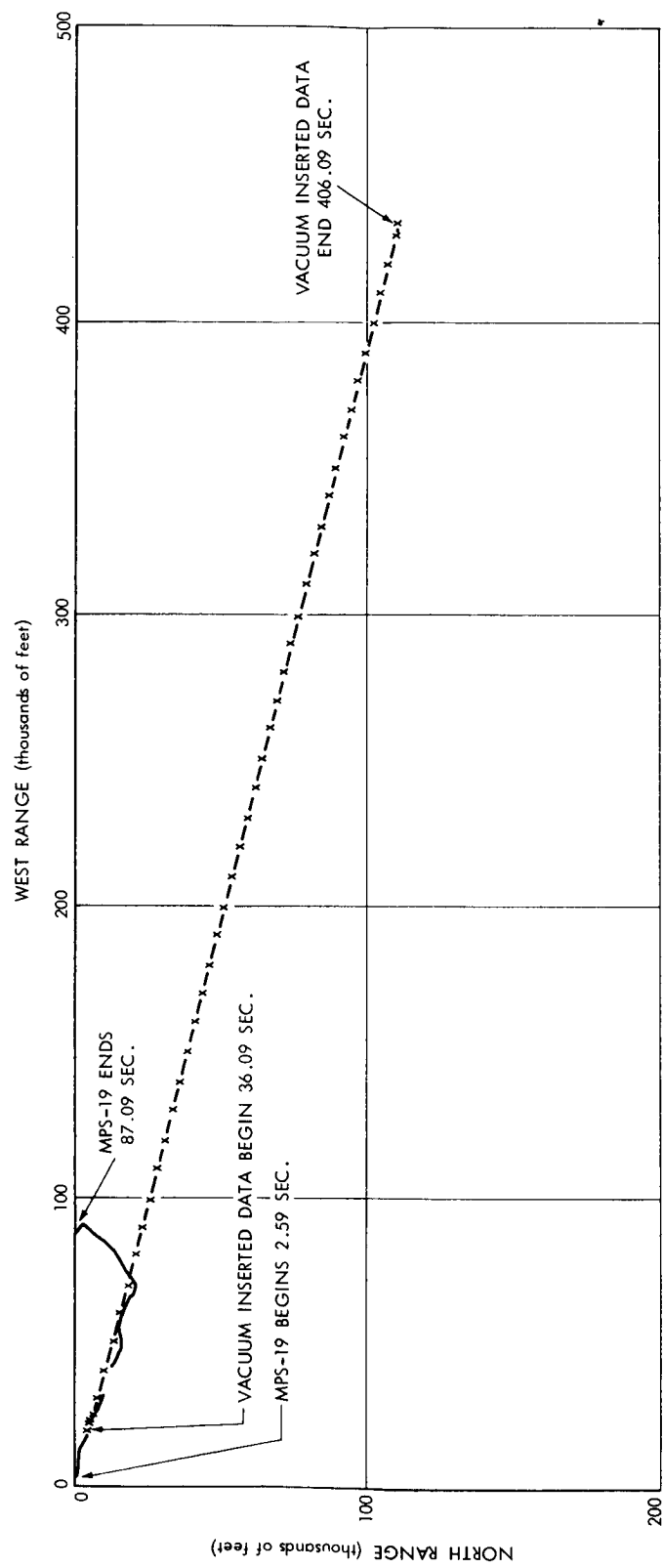


Figure 283. 14.228 UI Radar Plot, North Range vs West Range

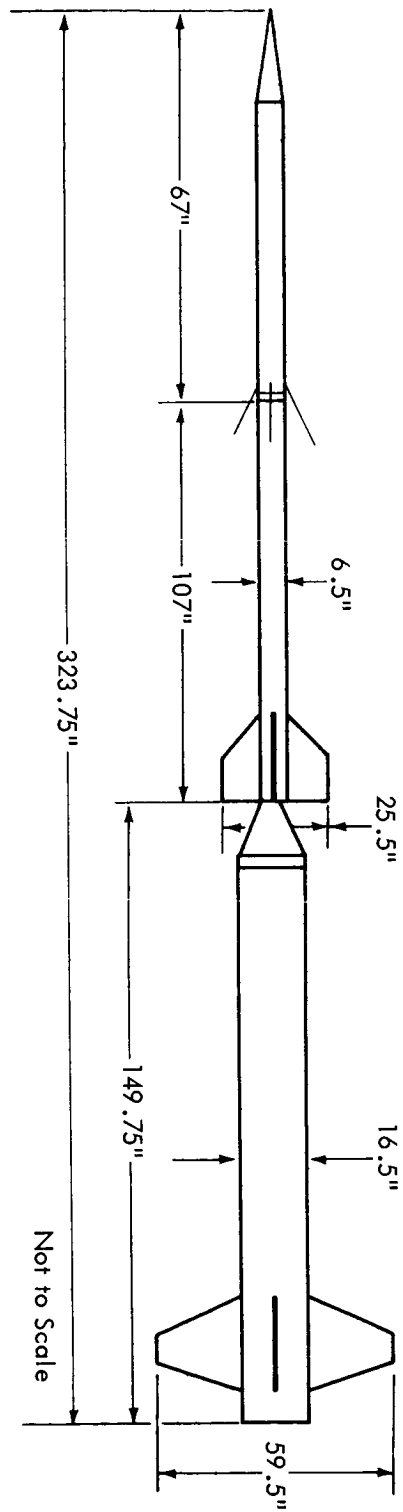


Figure 284. 14.229 UI Sketch

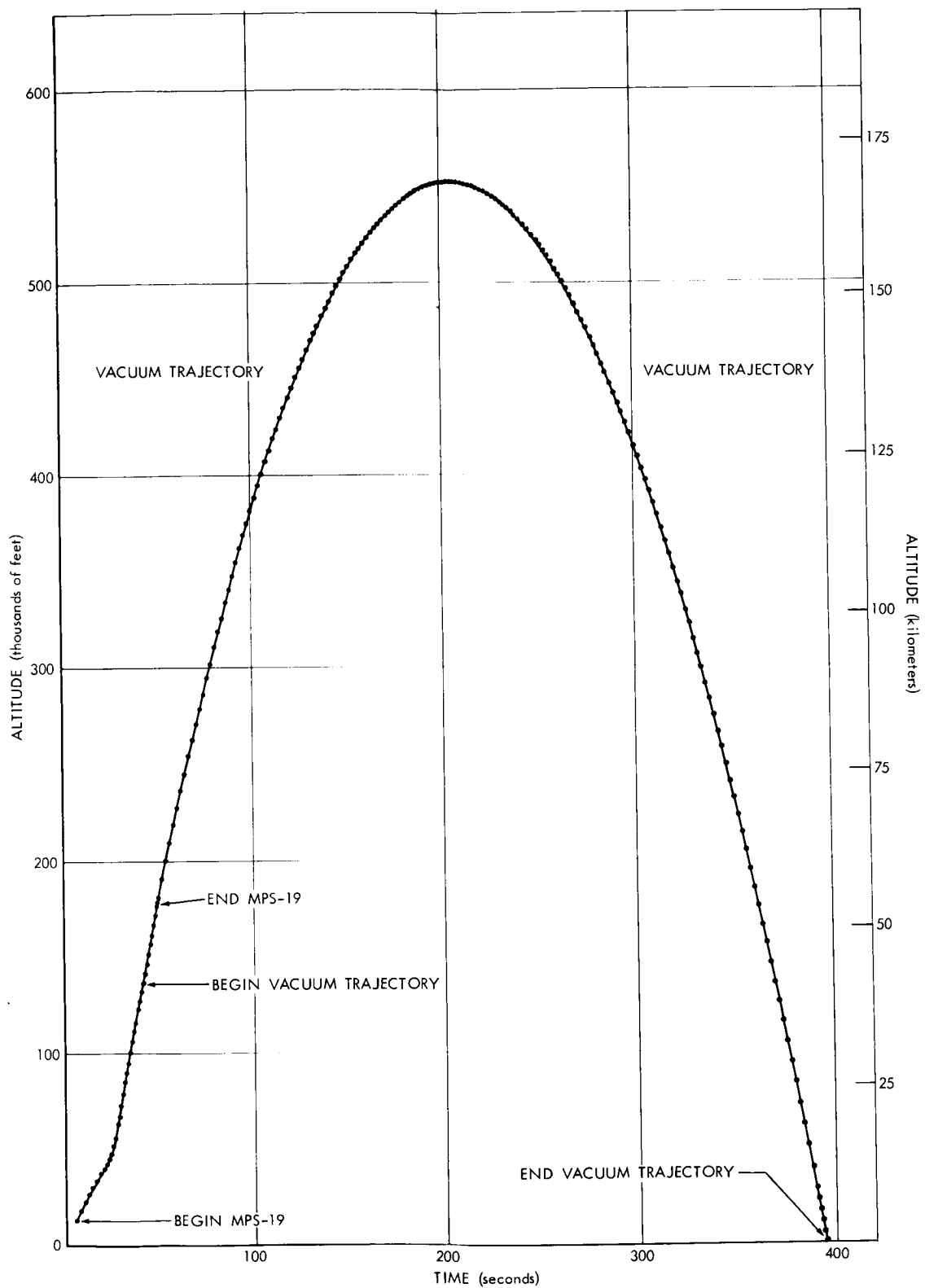


Figure 285. 14.229 UI Radar Plot, Altitude vs Time



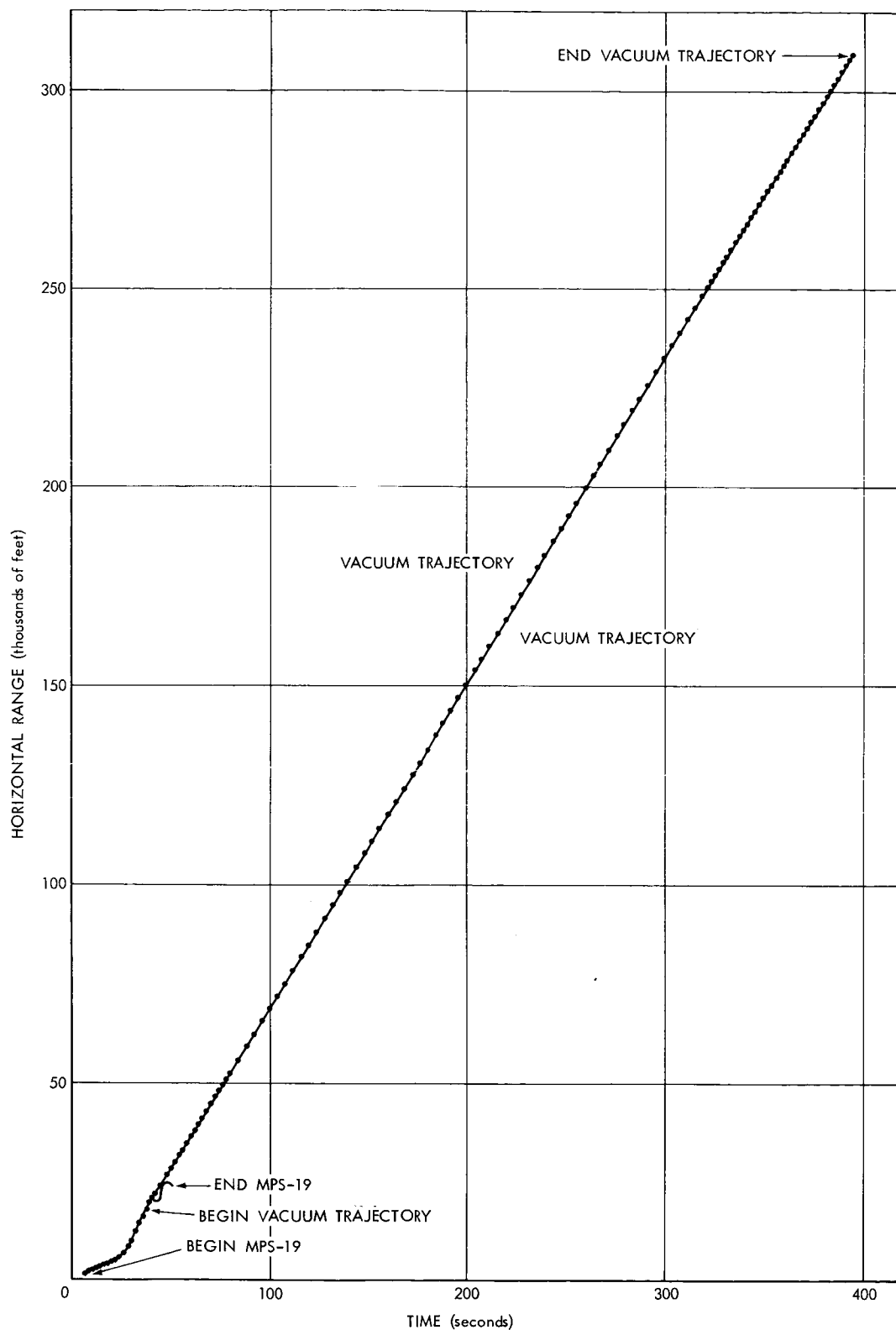


Figure 286. 14.229 UI Radar Plot, Horizontal Range vs Time

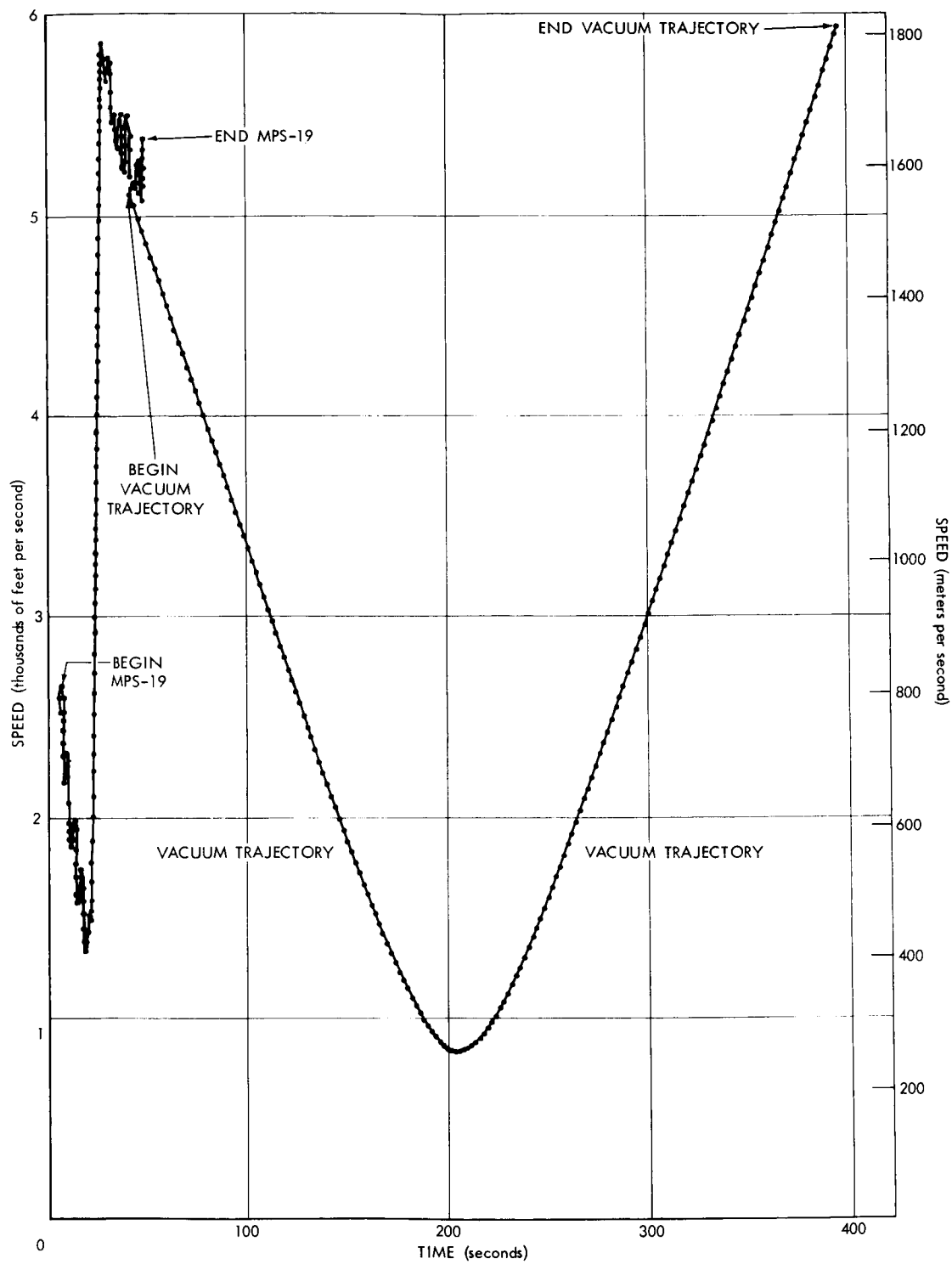


Figure 287. 14.229 UI Radar Plot, Speed vs Time

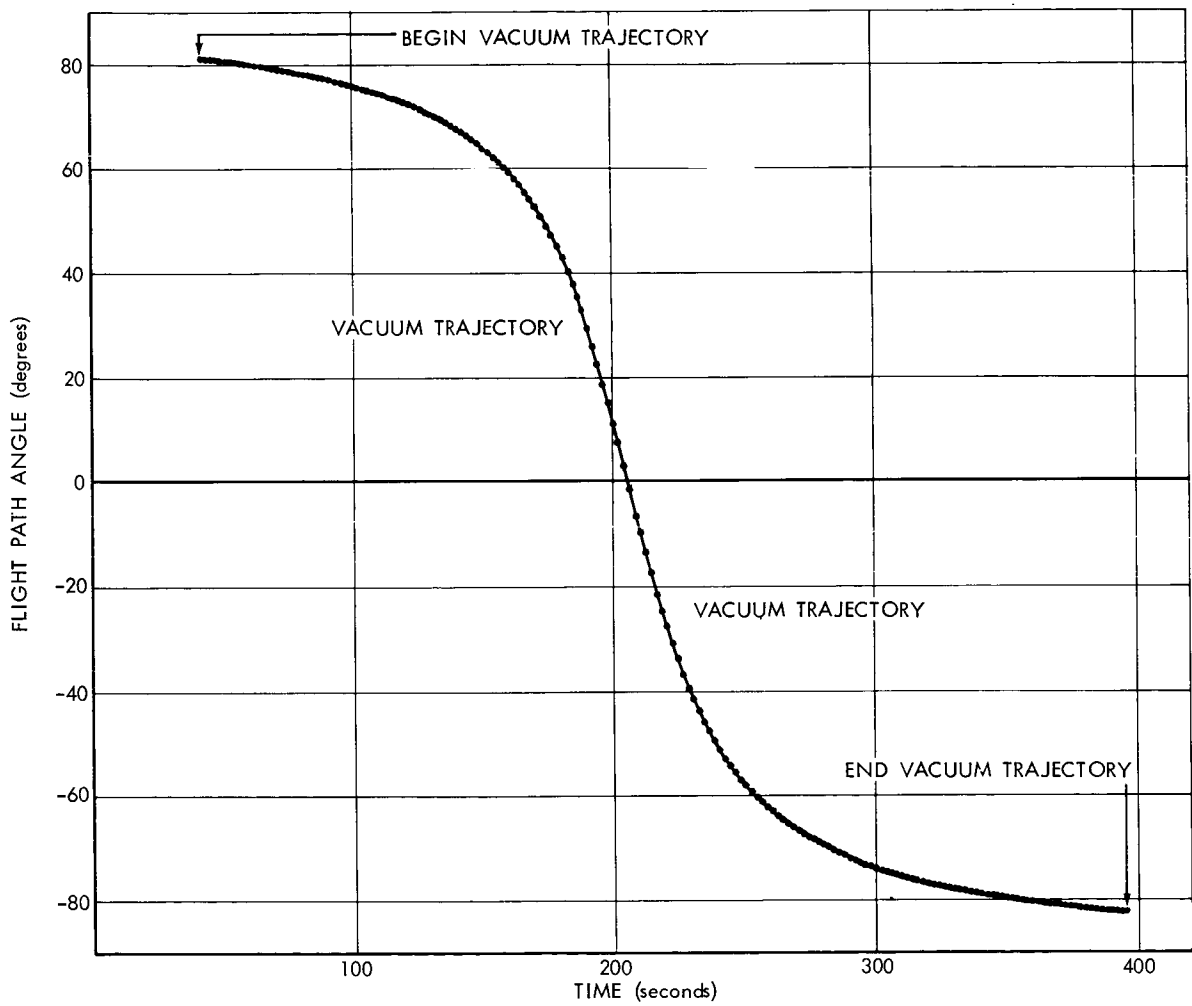


Figure 288. 14.229 UI Radar Plot, Flight Path Angle vs Time

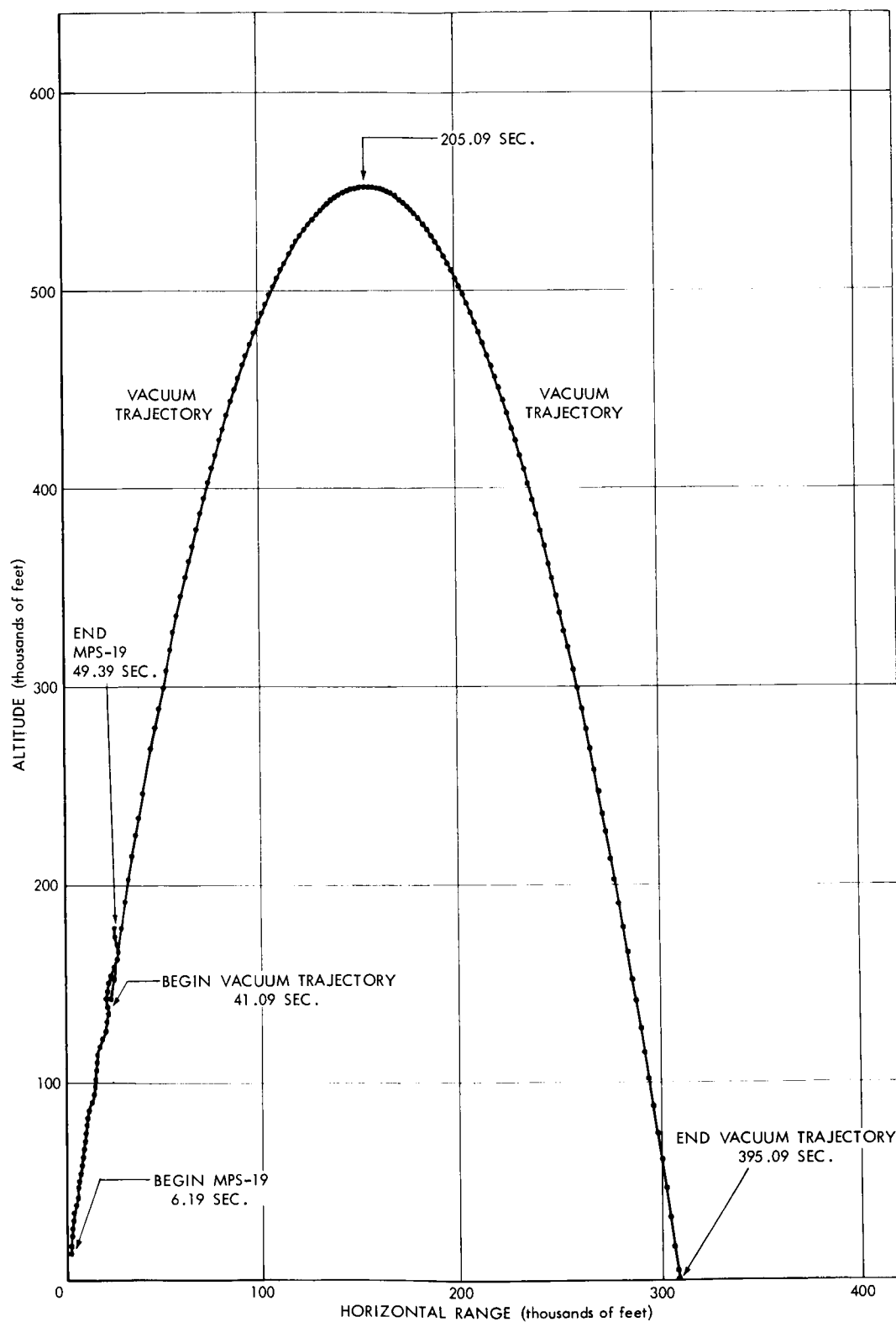


Figure 289. 14.229 UI Radar Plot, Altitude vs Horizontal Range

NORTH RANGE (thousands of feet)

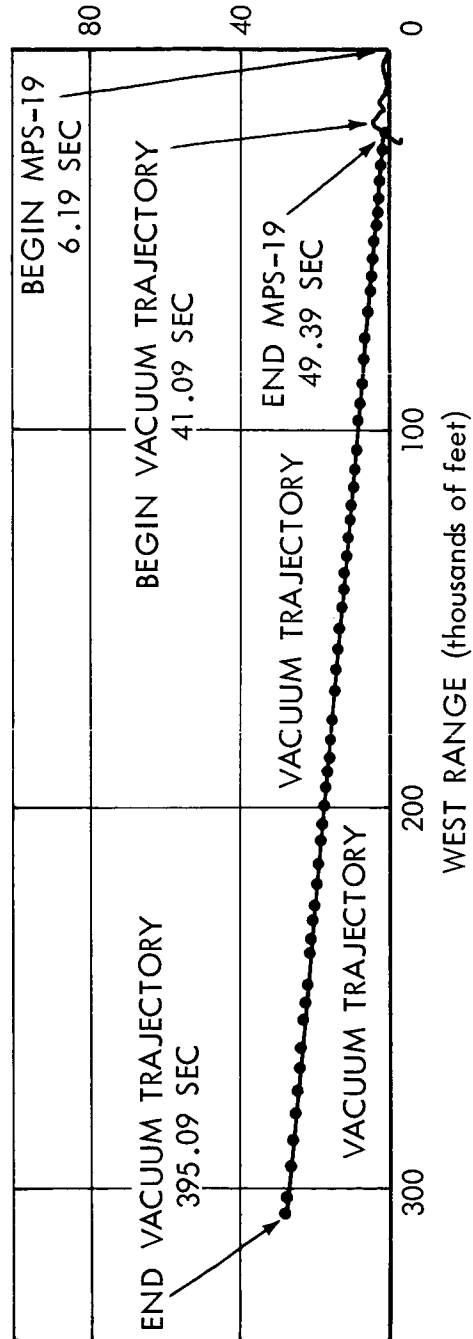


Figure 290. 14.229 UI Radar Plot, North Range vs West Range

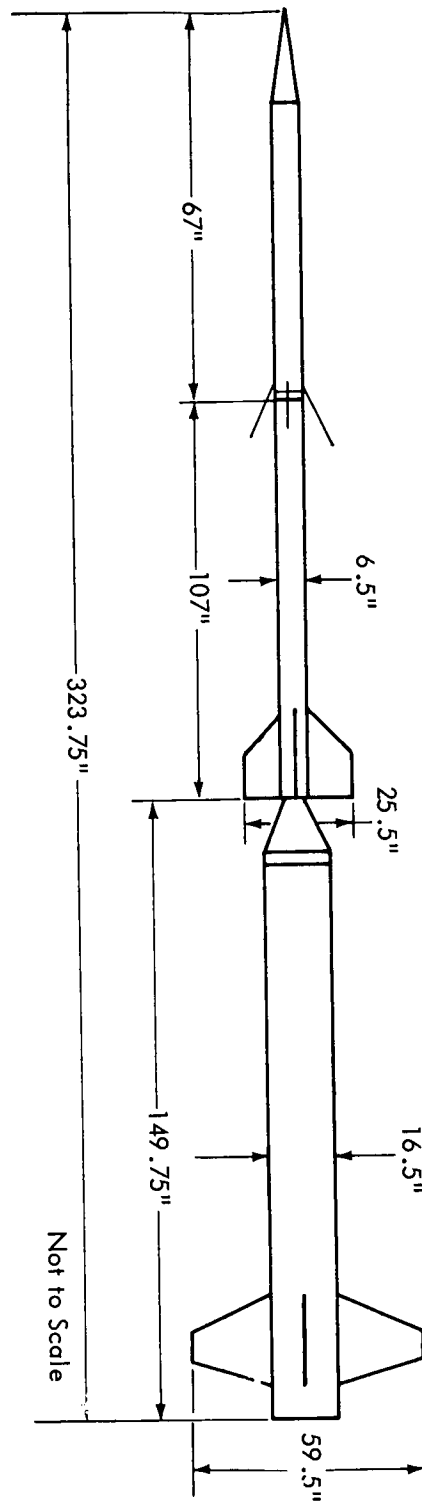


Figure 291. 14.230 UI Sketch

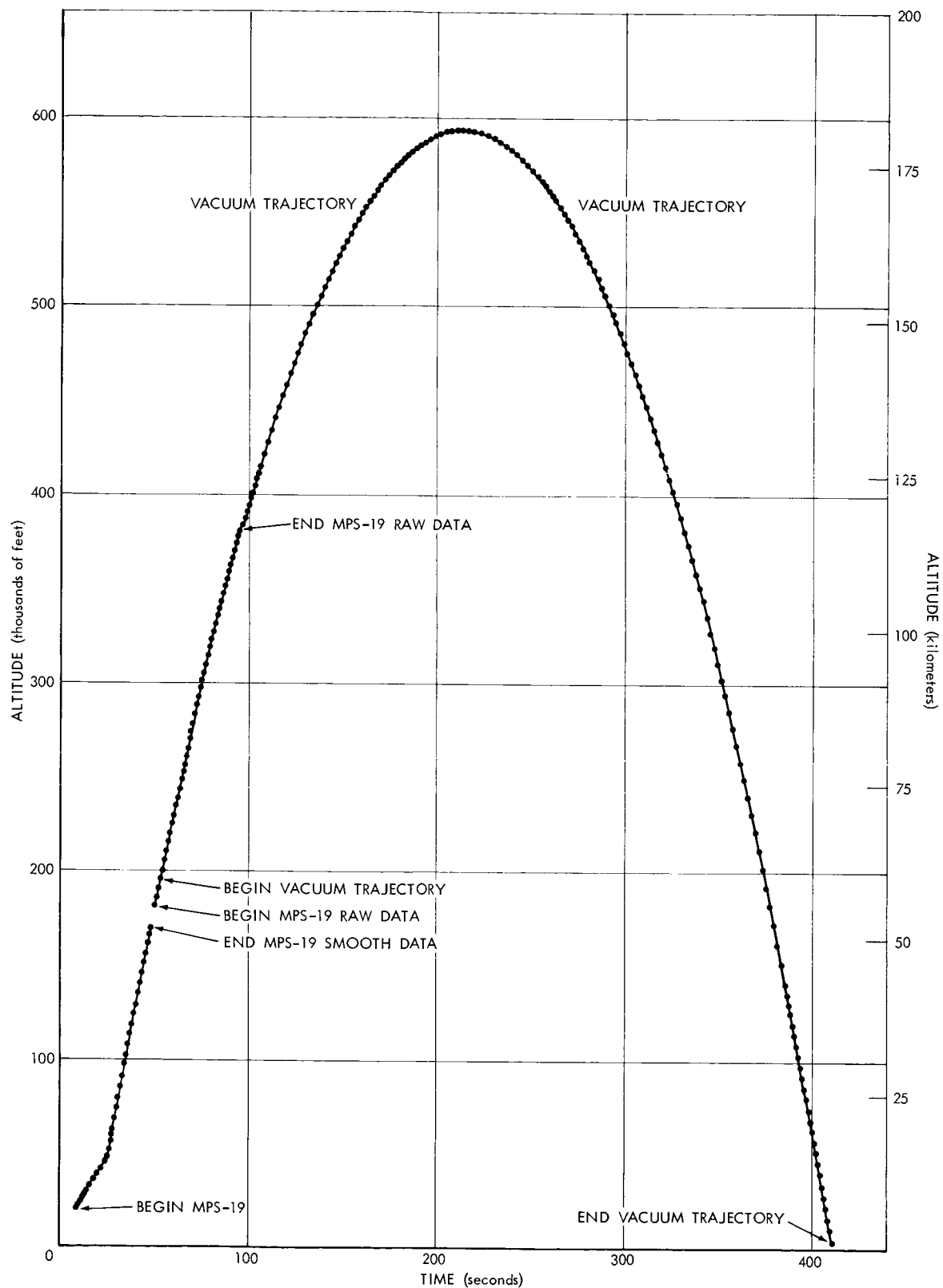


Figure 292. 14.230 UI Radar Plot, Altitude vs Time

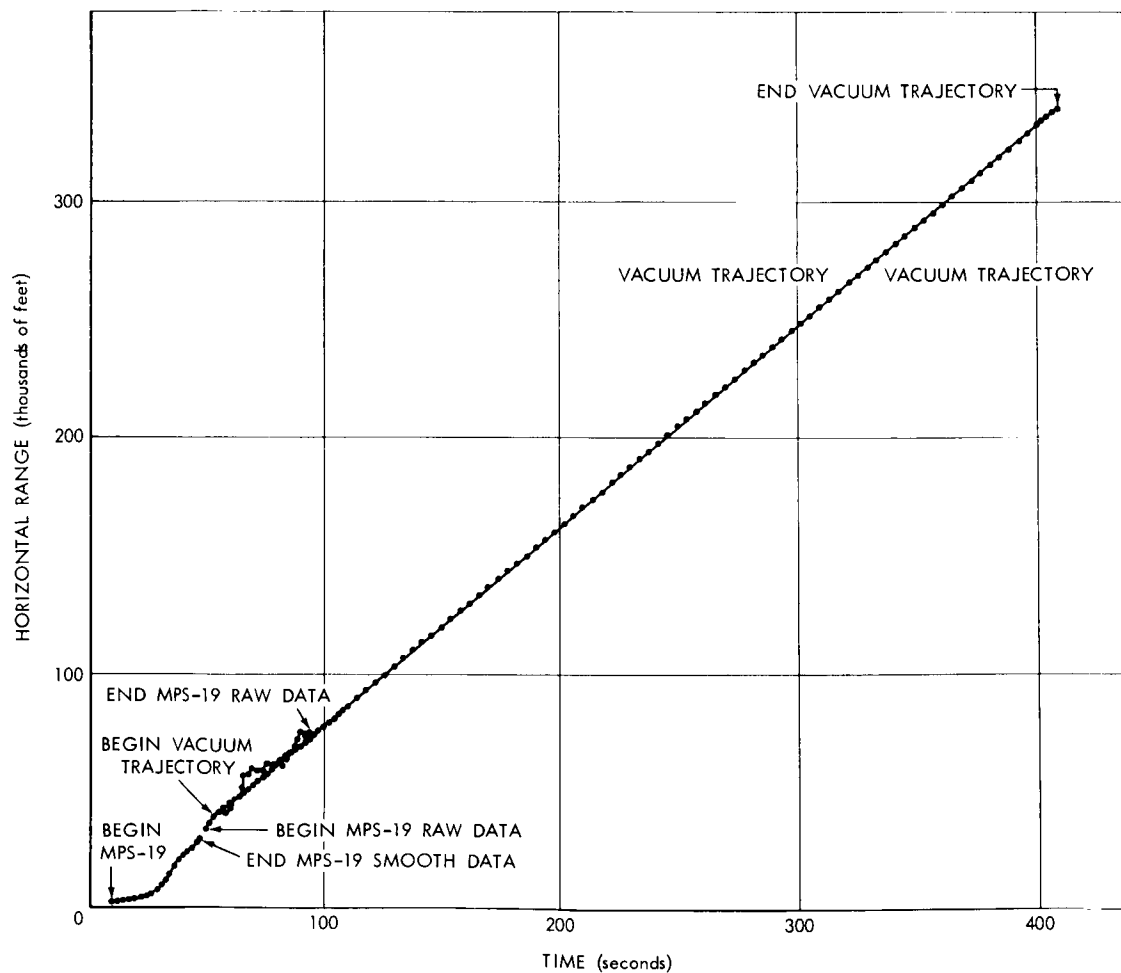


Figure 293. 14.230 UI Radar Plot, Horizontal Range vs Time



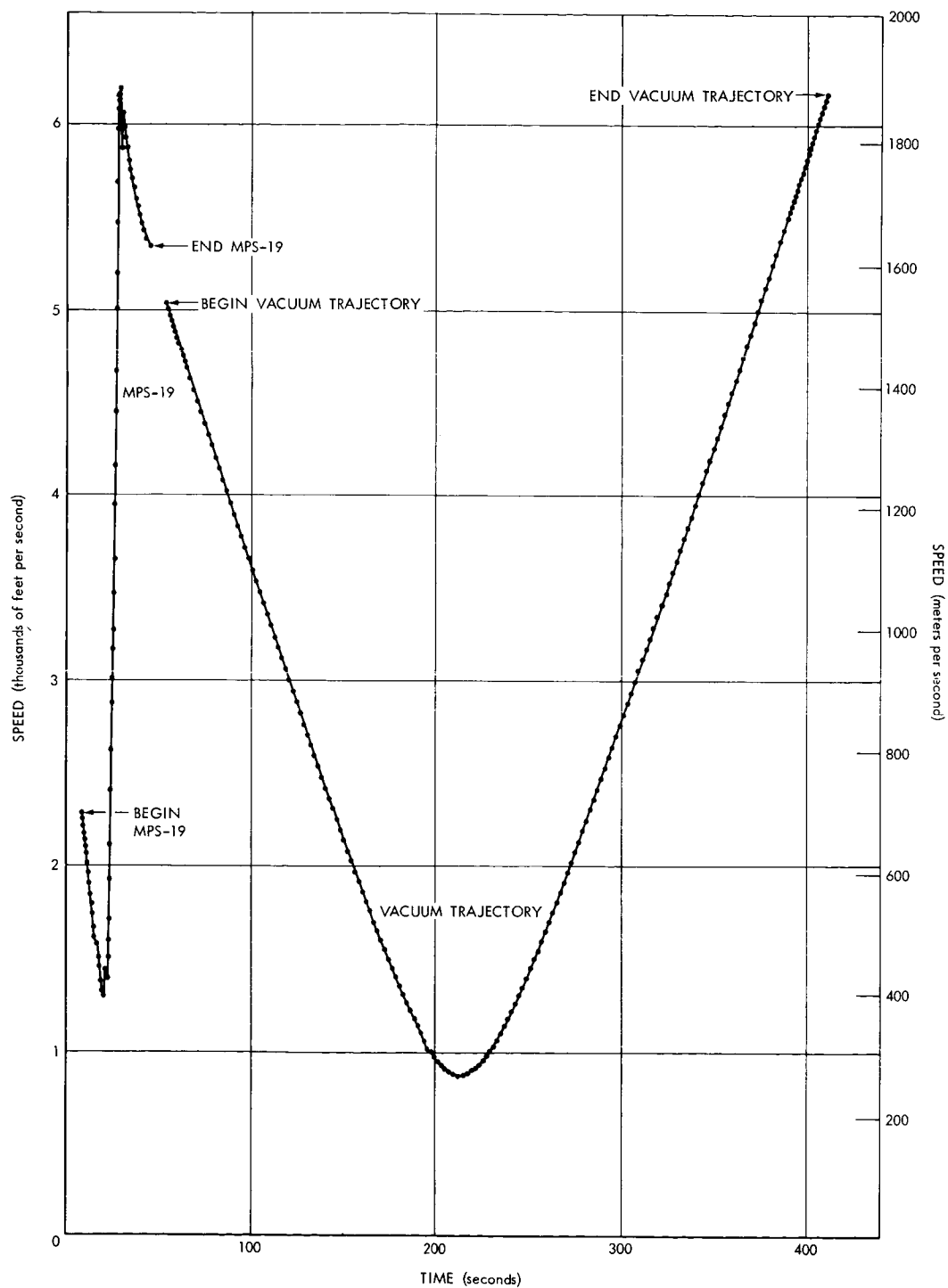


Figure 294. 14.230 UI Radar Plot, Speed vs Time

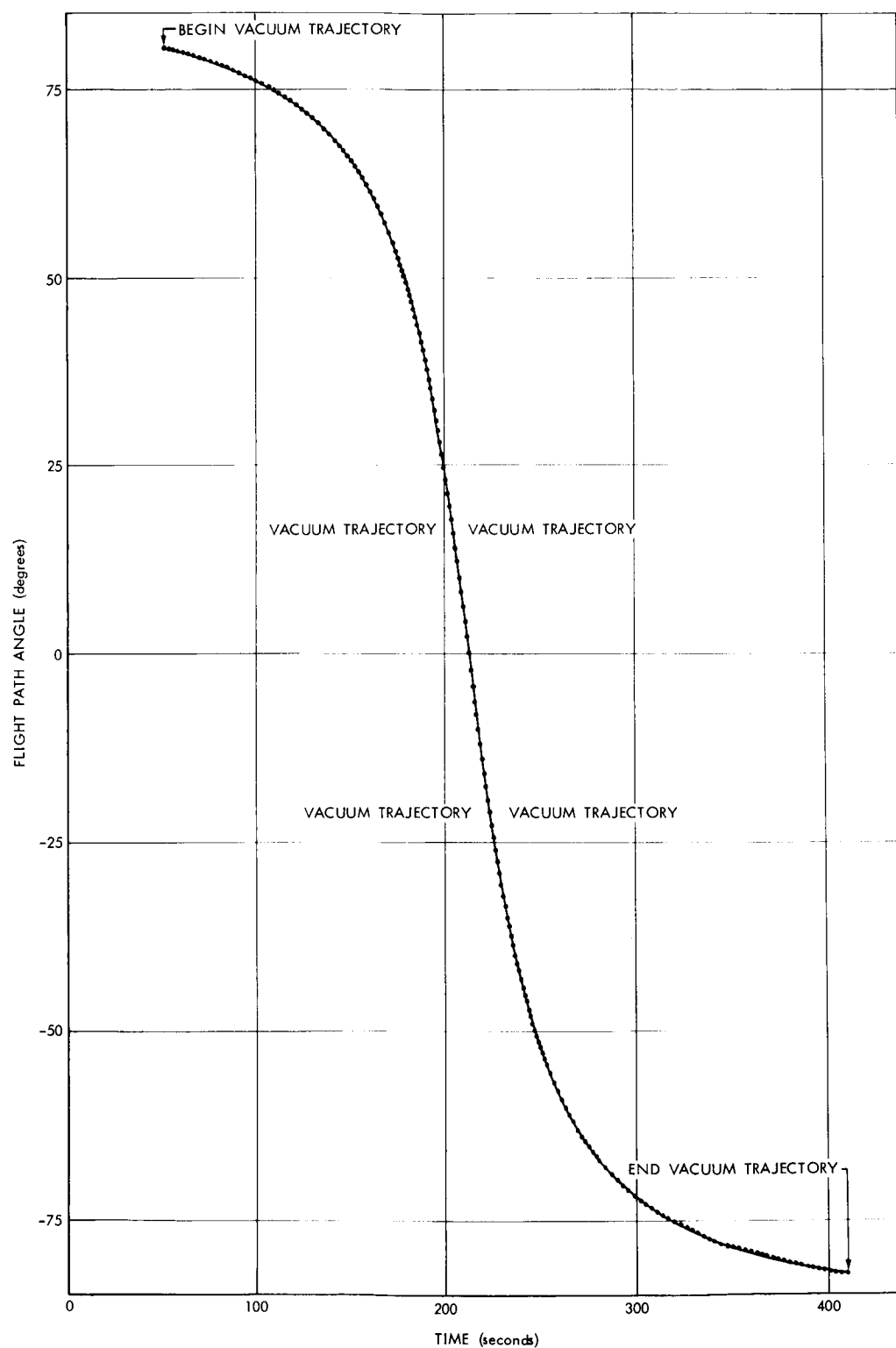


Figure 295. 14.230 UI Radar Plot, Flight Path Angle vs Time

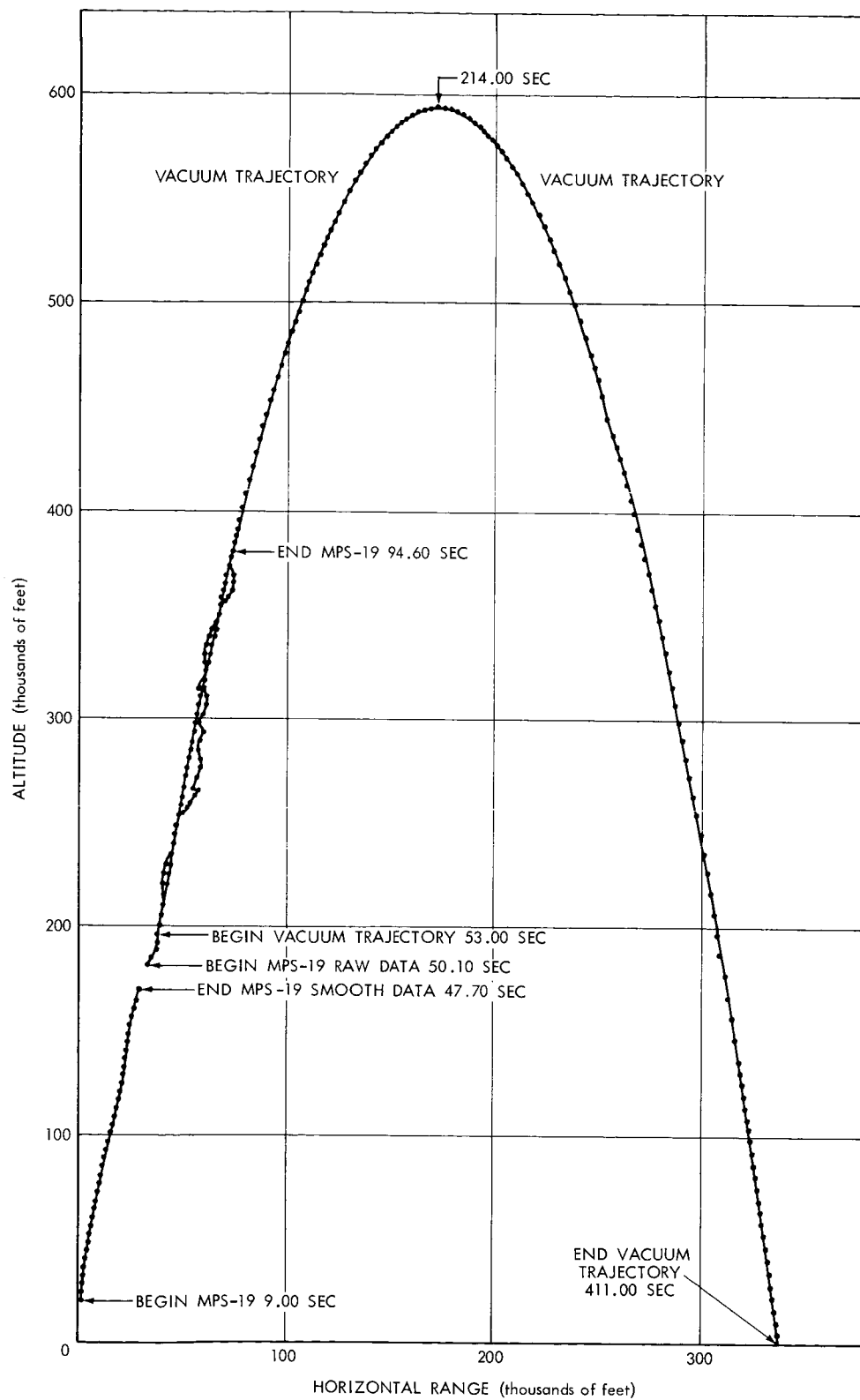


Figure 296. 14.230 UI Radar Plot, Altitude vs Horizontal Range

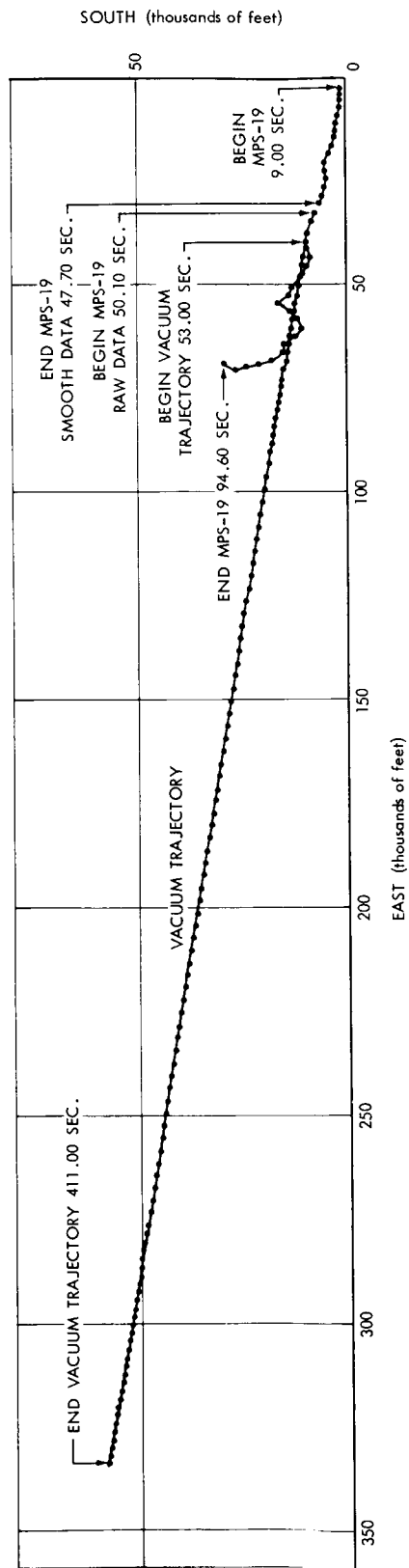


Figure 297. 14.230 UI Radar Plot, South Range vs East Range

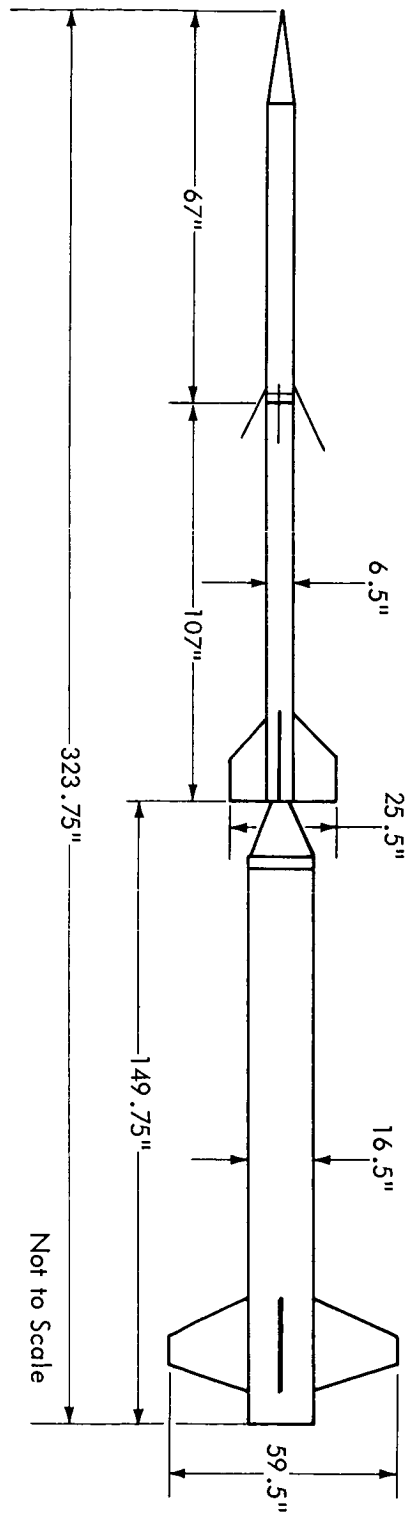


Figure 298. 14.231 UI Sketch

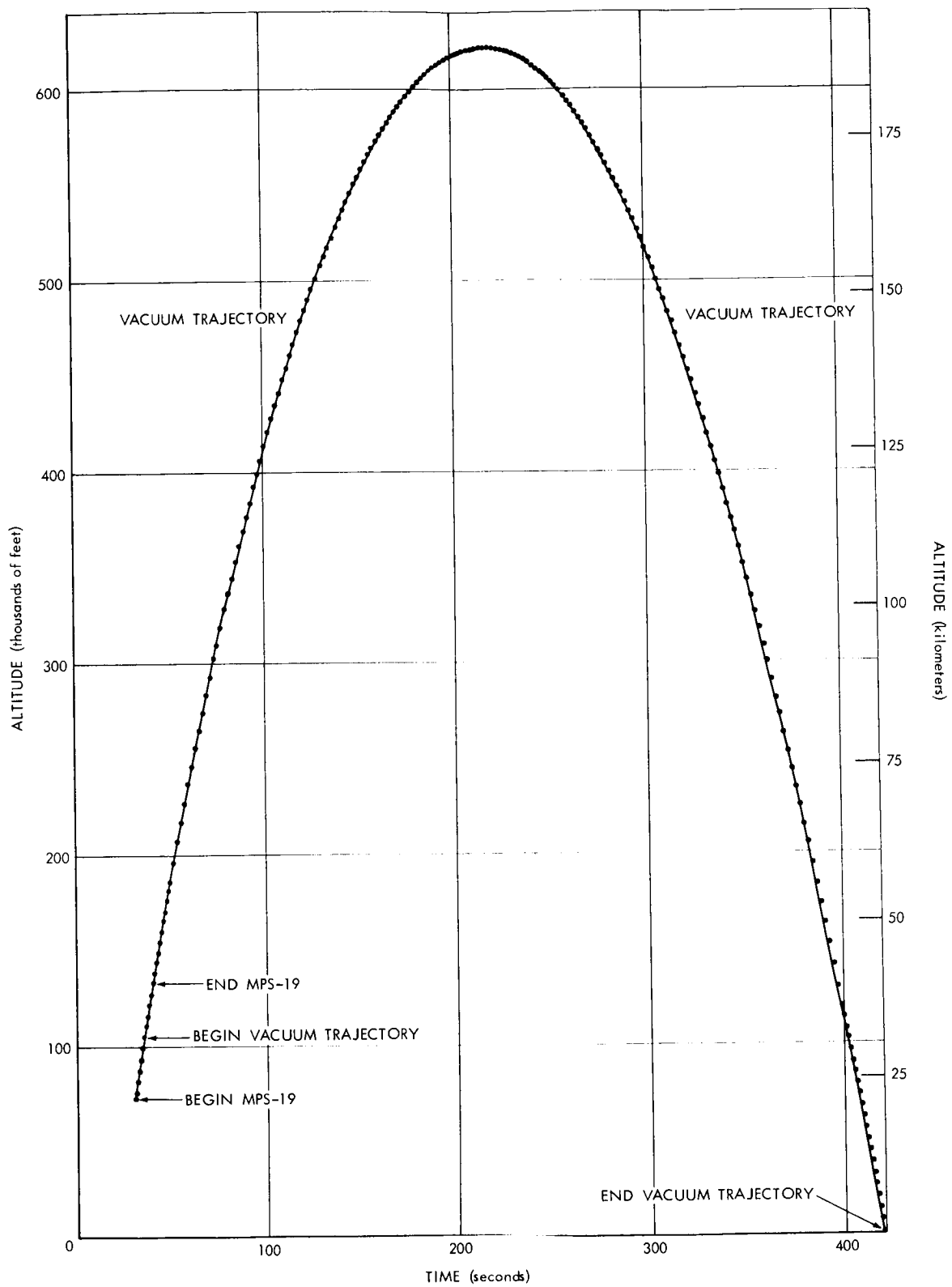


Figure 299. 14.231 UI Radar Plot, Altitude vs Time

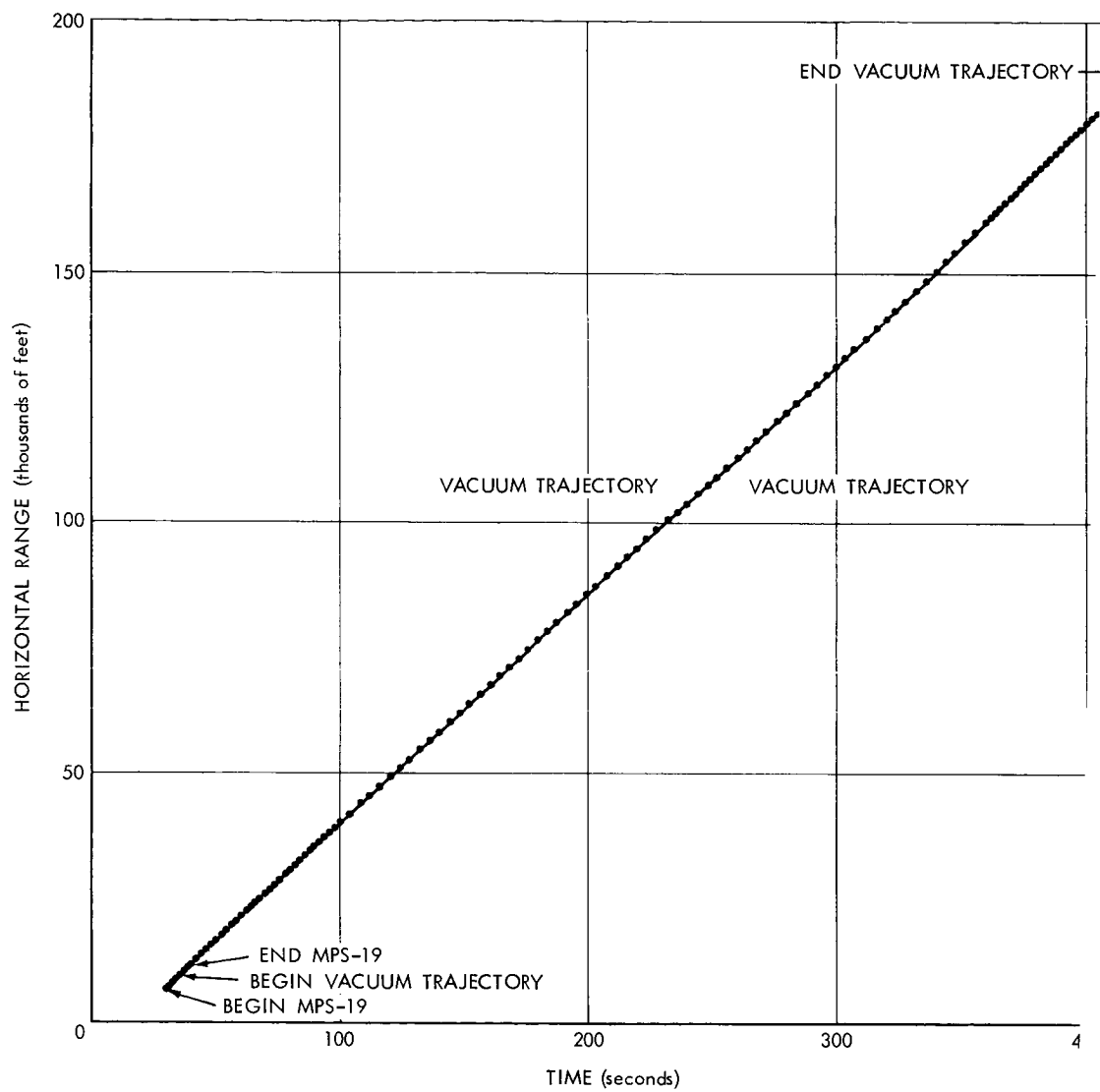


Figure 300. 14.231 UI Radar Plot, Horizontal Range vs Time

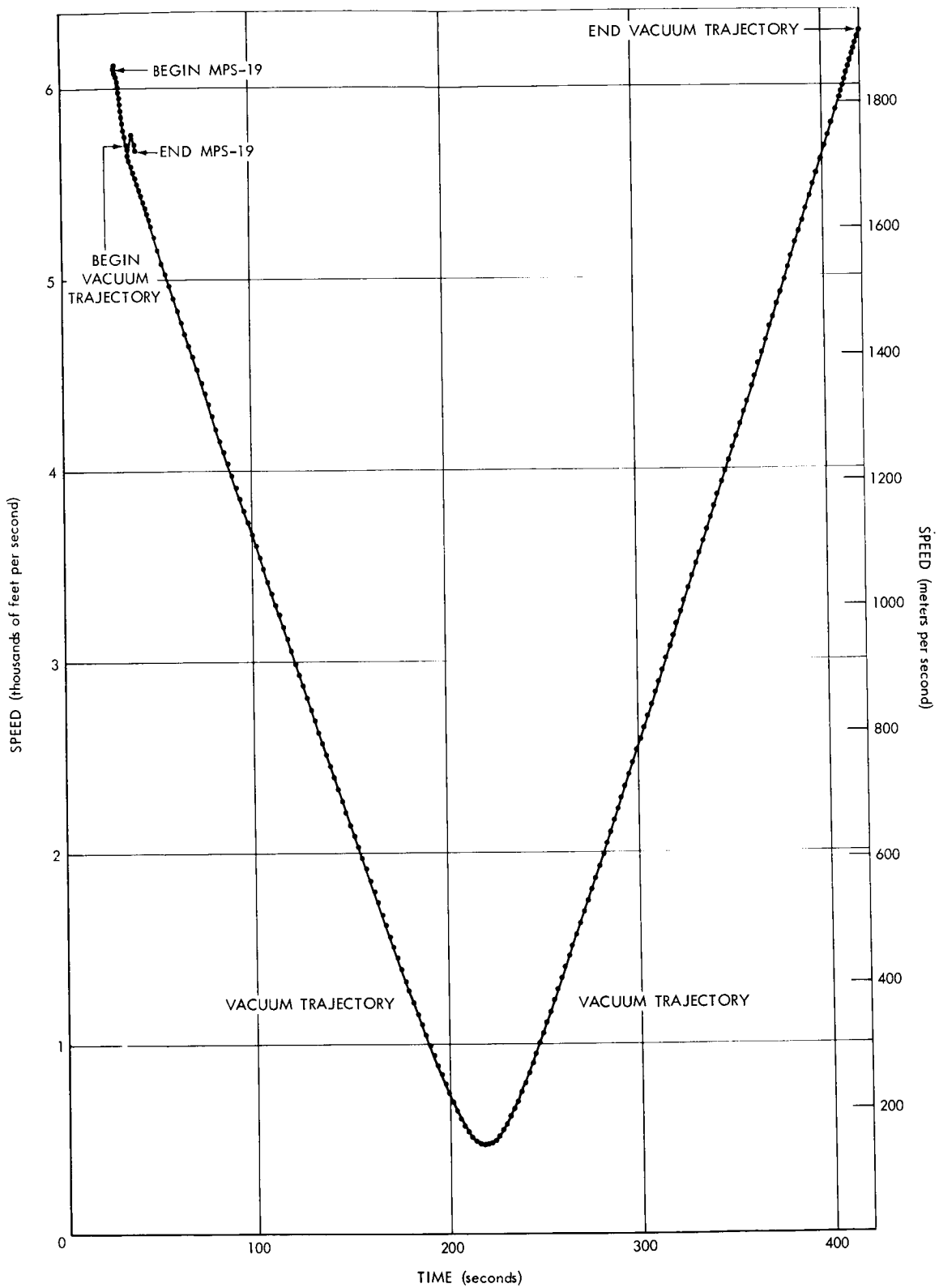


Figure 301. 14.231 UI Radar Plot, Speed vs Time



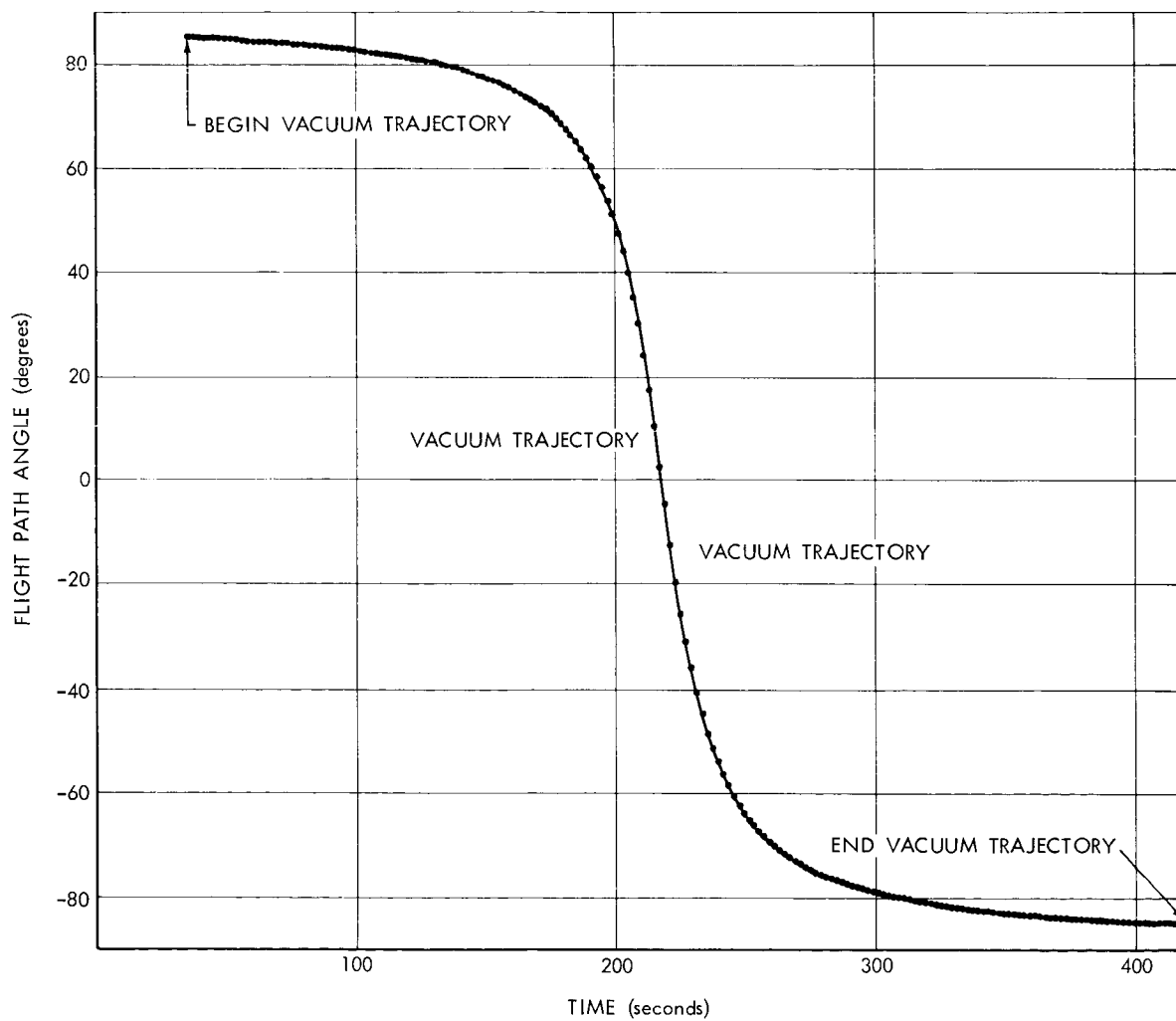


Figure 302. 14.231 UI Radar Plot, Flight Path Angle vs Time

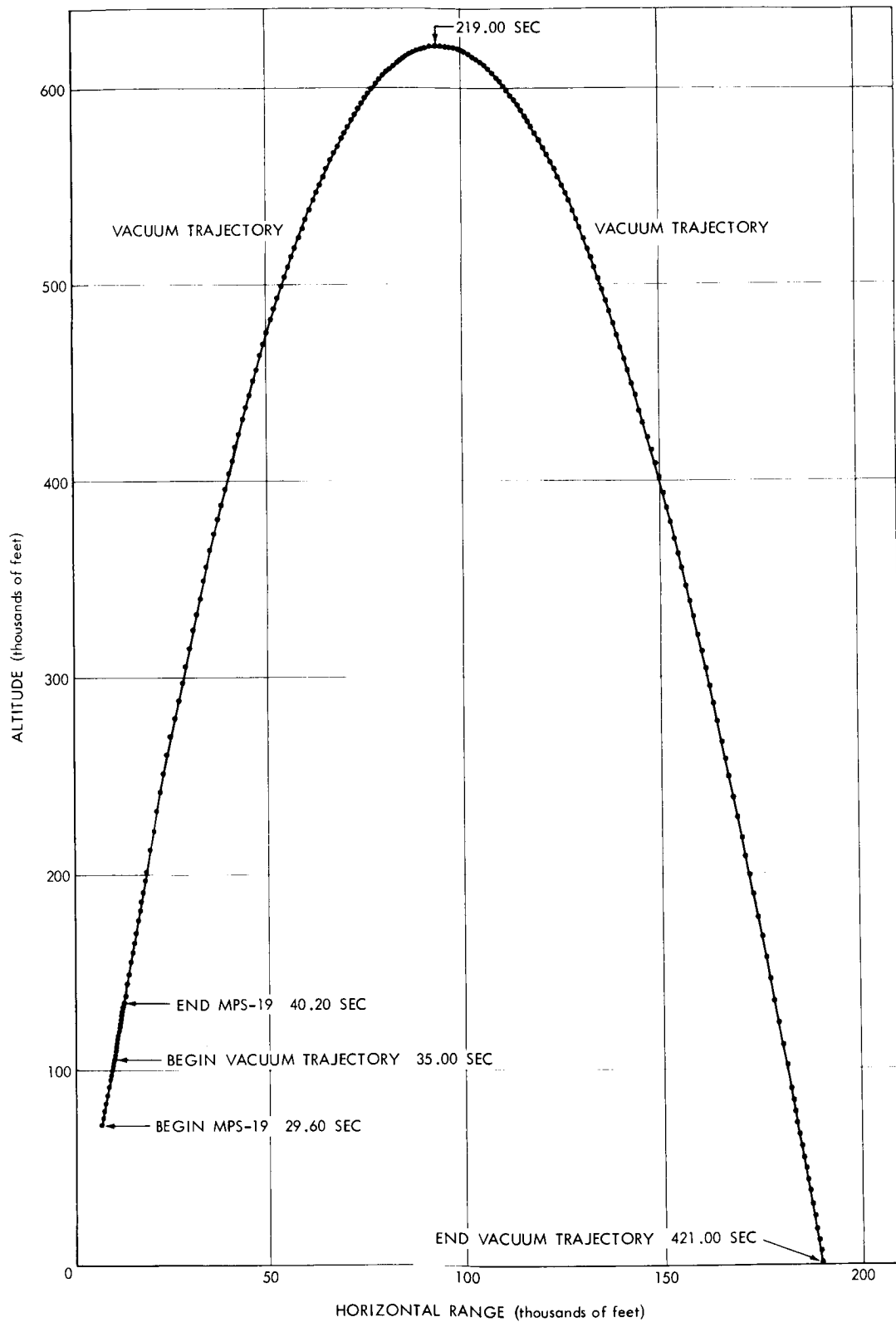


Figure 303. 14.231 UI Radar Plot, Altitude vs Horizontal Range

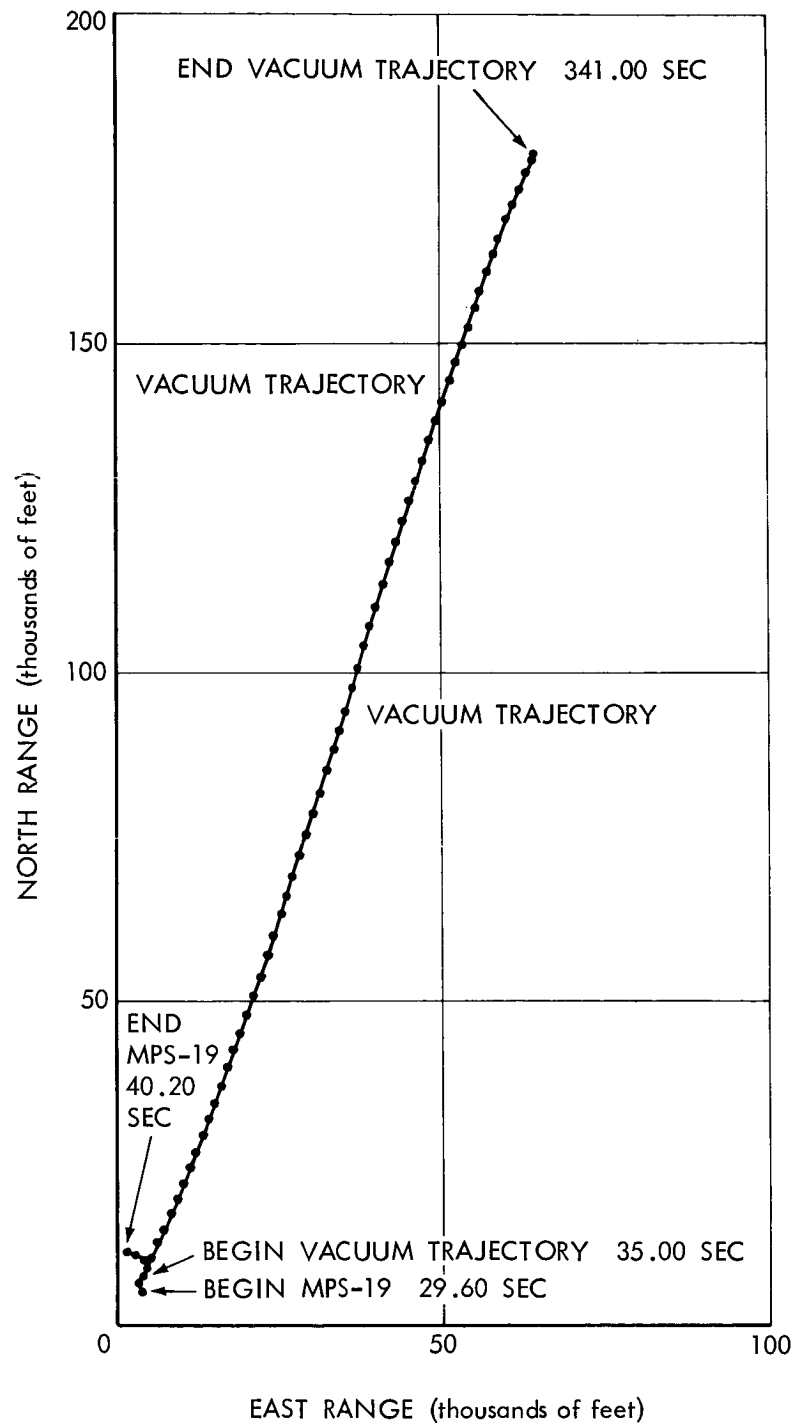


Figure 304. 14.231 UI Radar Plot, North Range vs East Range

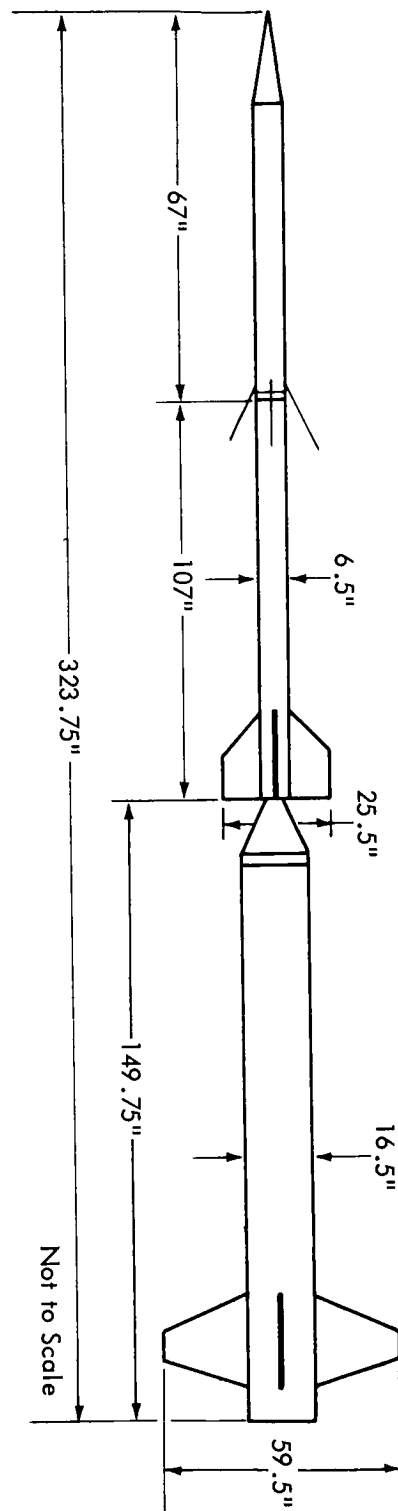


Figure 305. 14.232 UI Sketch

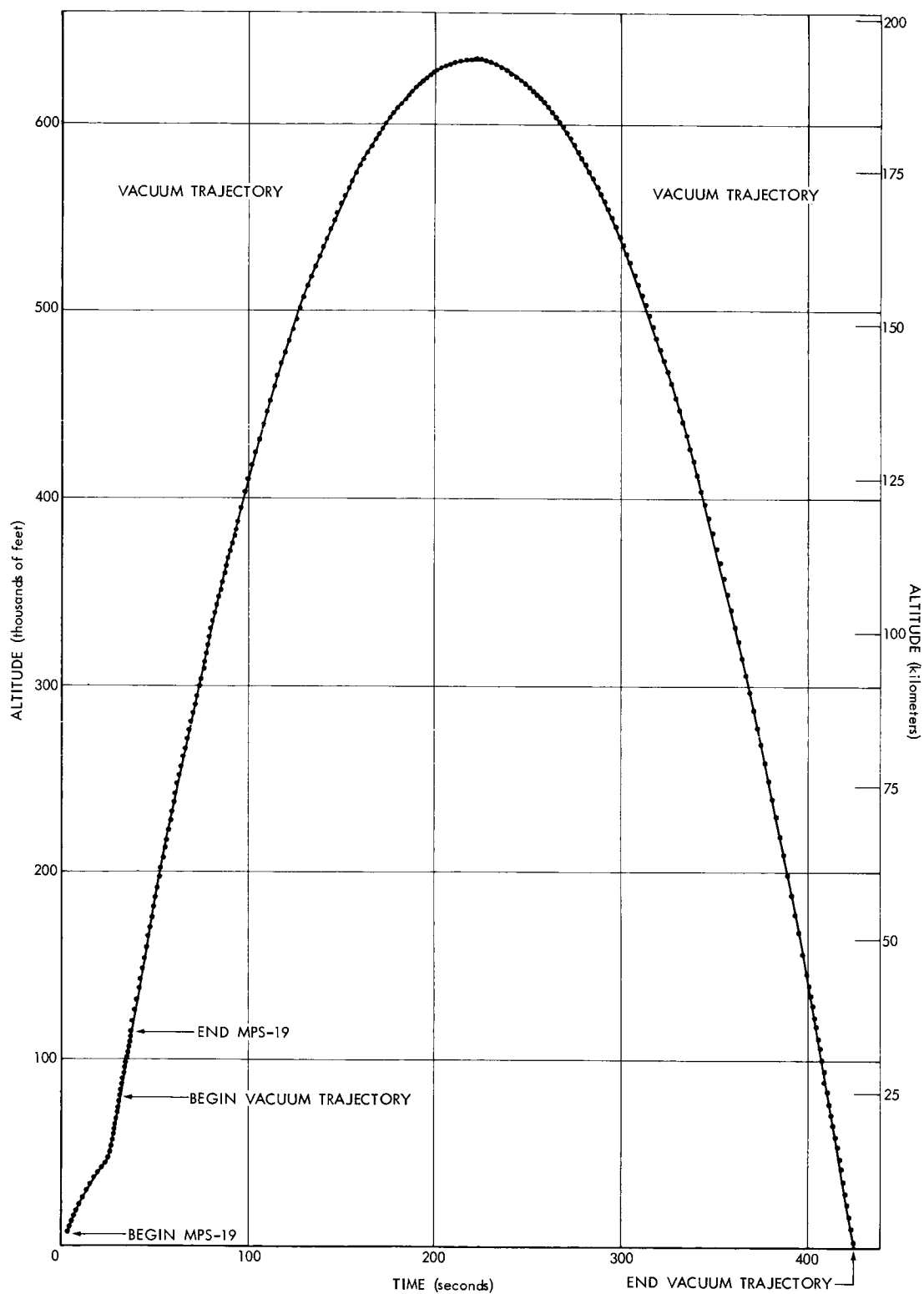


Figure 306. 14.232 UI Radar Plot, Altitude vs Time

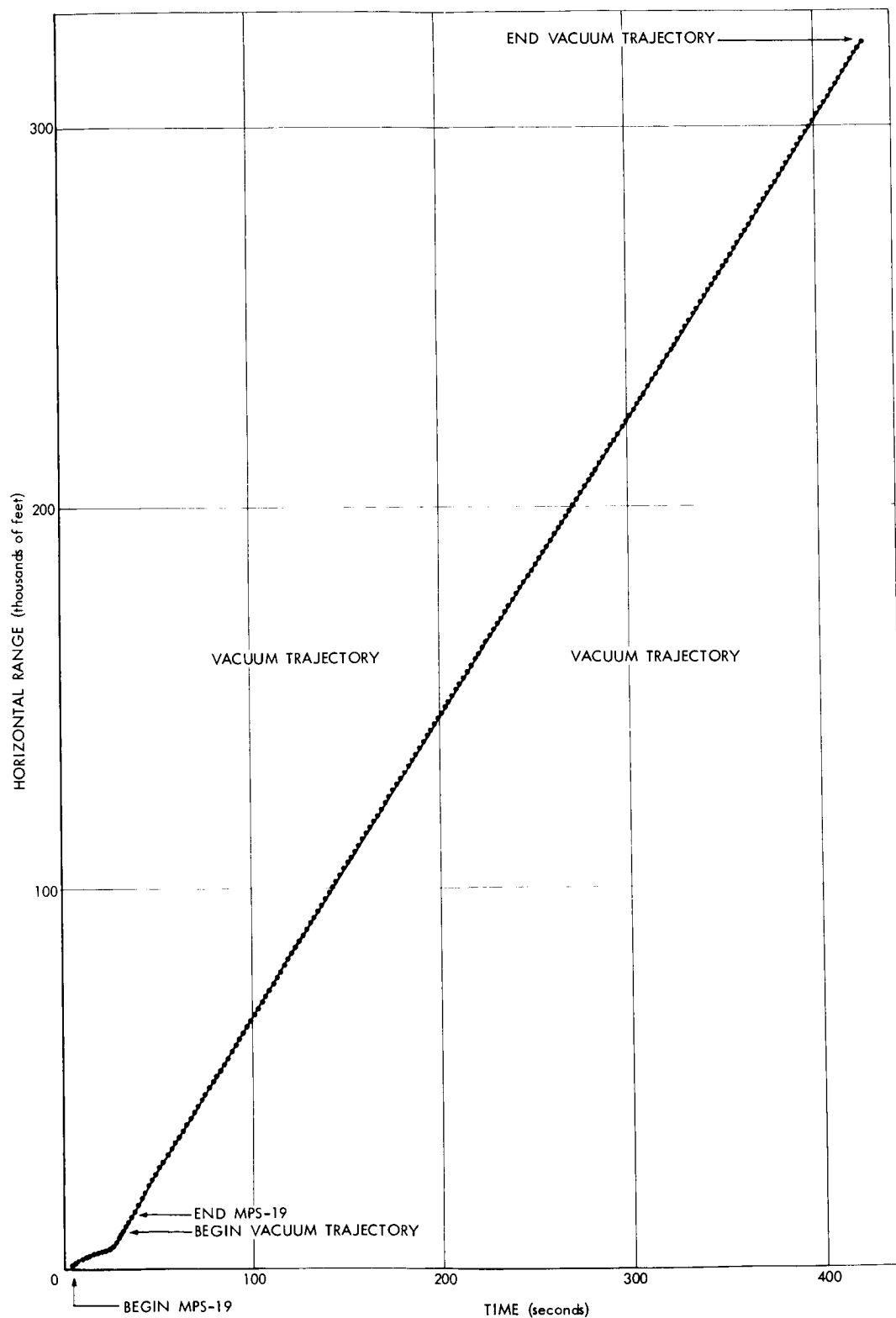


Figure 307. 14.232 UI Radar Plot, Horizontal Range vs Time

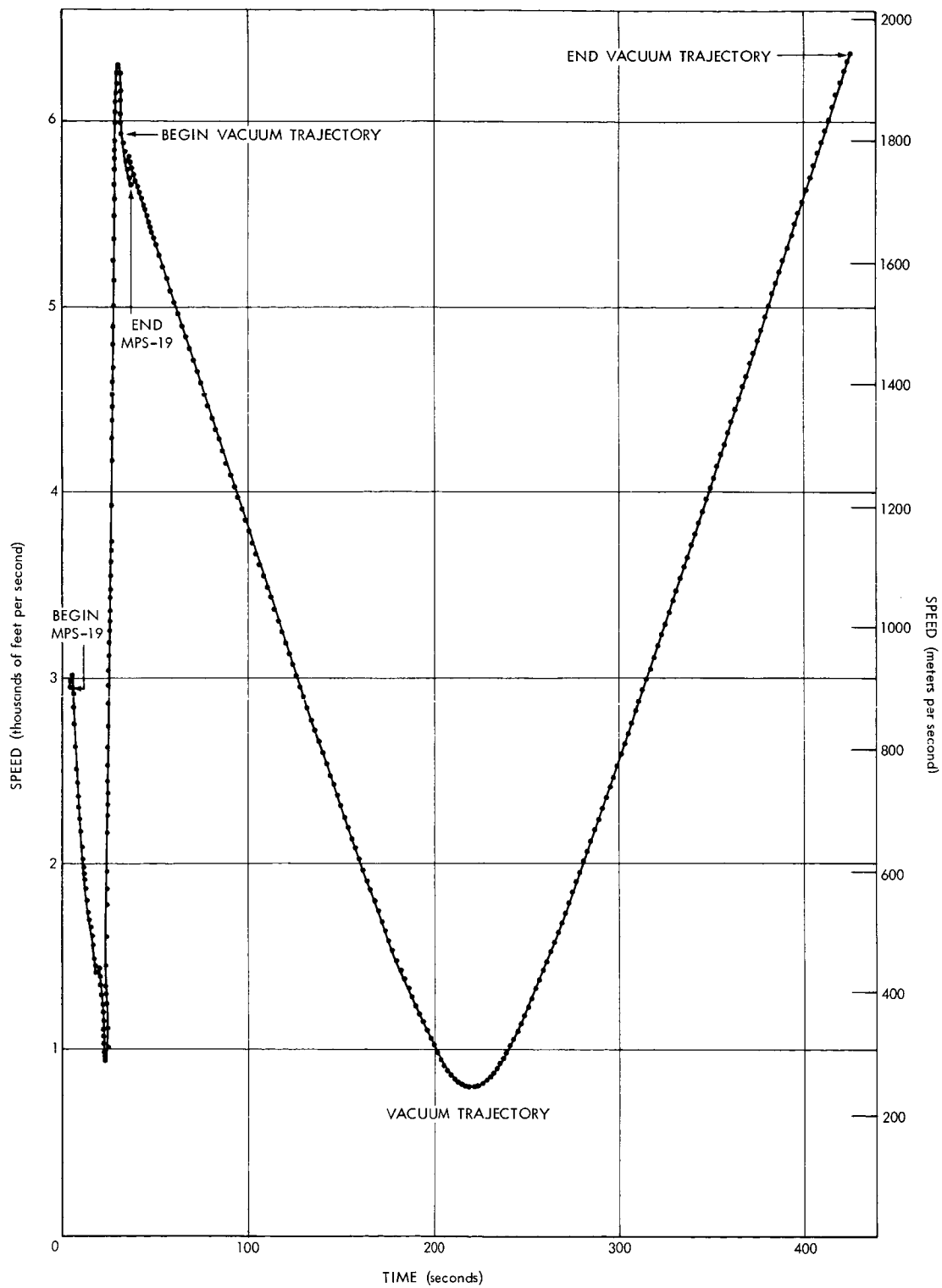


Figure 308. 14.232 UI Radar Plot, Speed vs Time

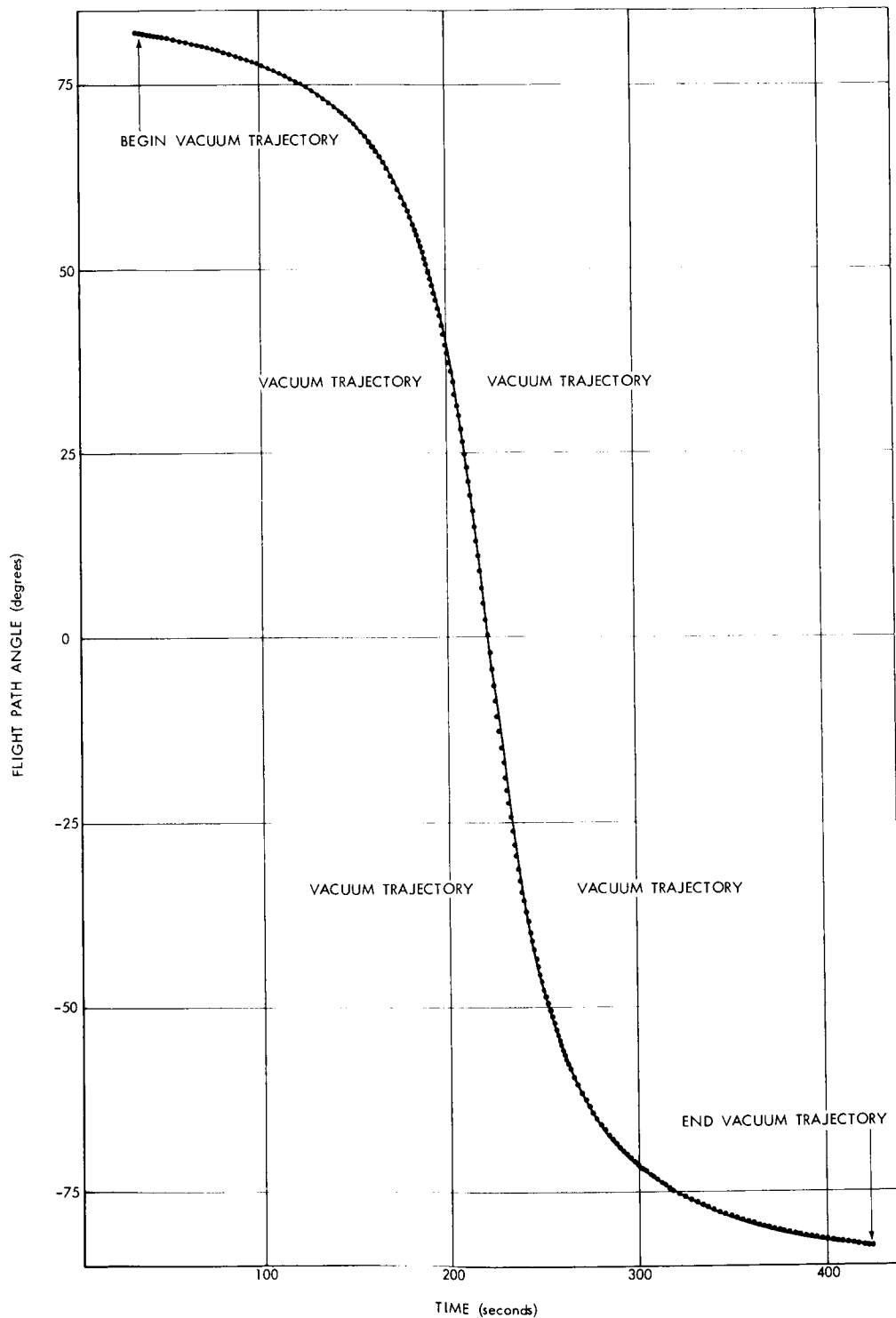


Figure 309. 14.232 UI Radar Plot, Flight Path Angle vs Time



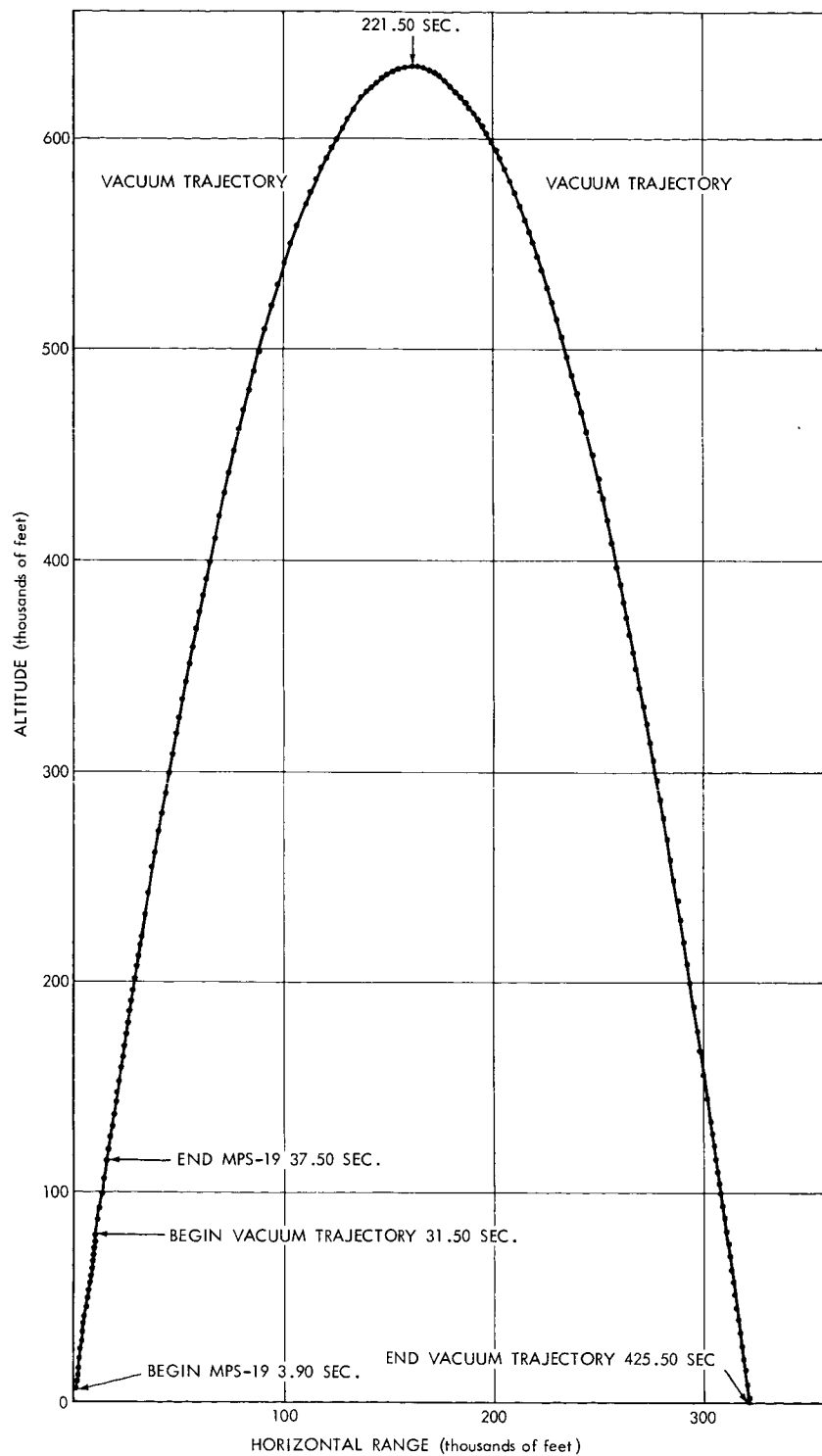


Figure 310. 14.232 UI Radar Plot, Altitude vs Horizontal Range

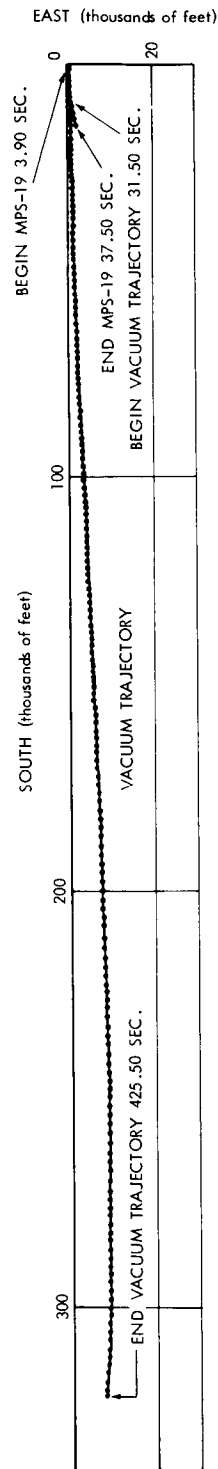


Figure 311. 14.232 UI Radar Plot, South Range vs East Range

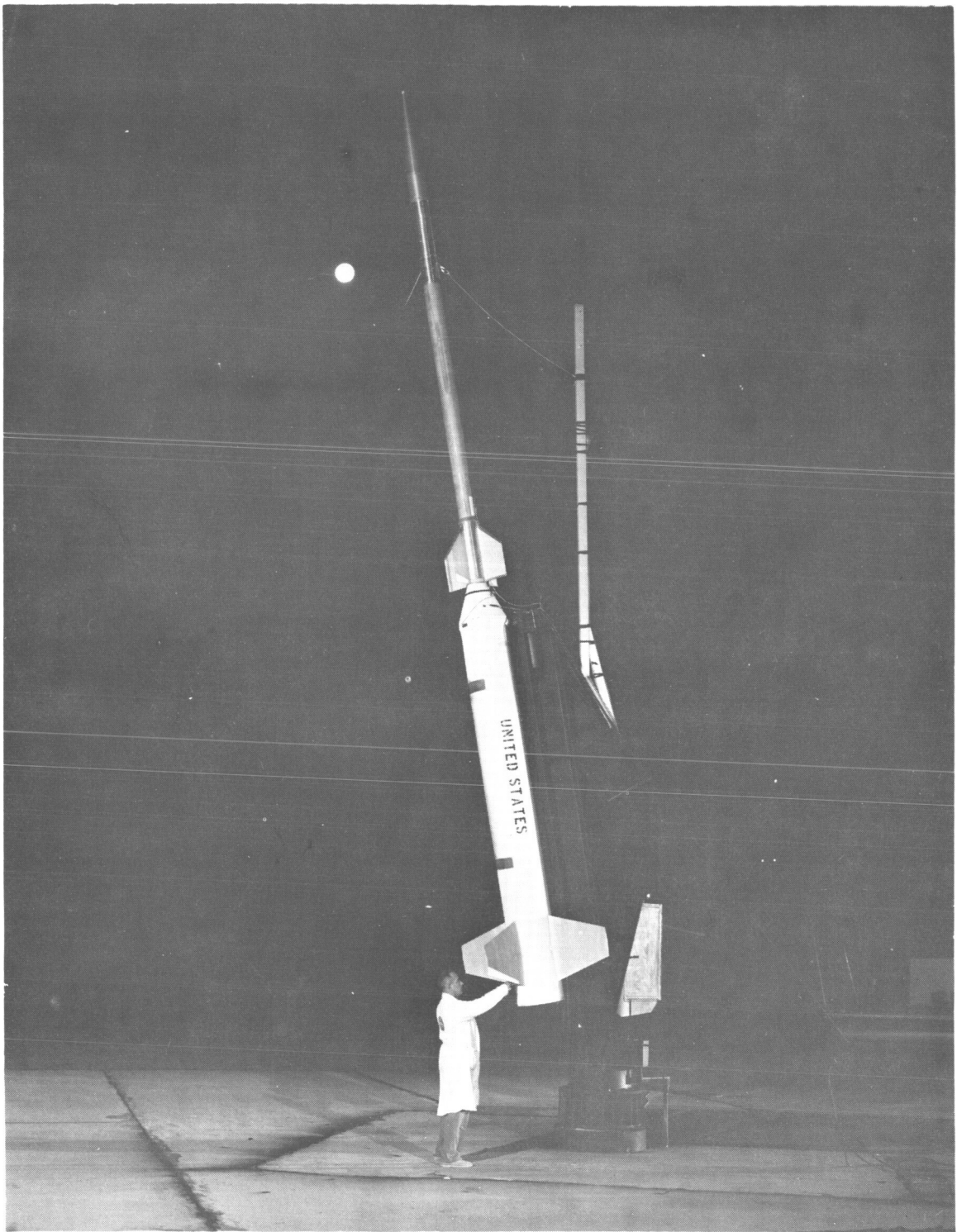


Figure 312. 14.245 UI Photograph

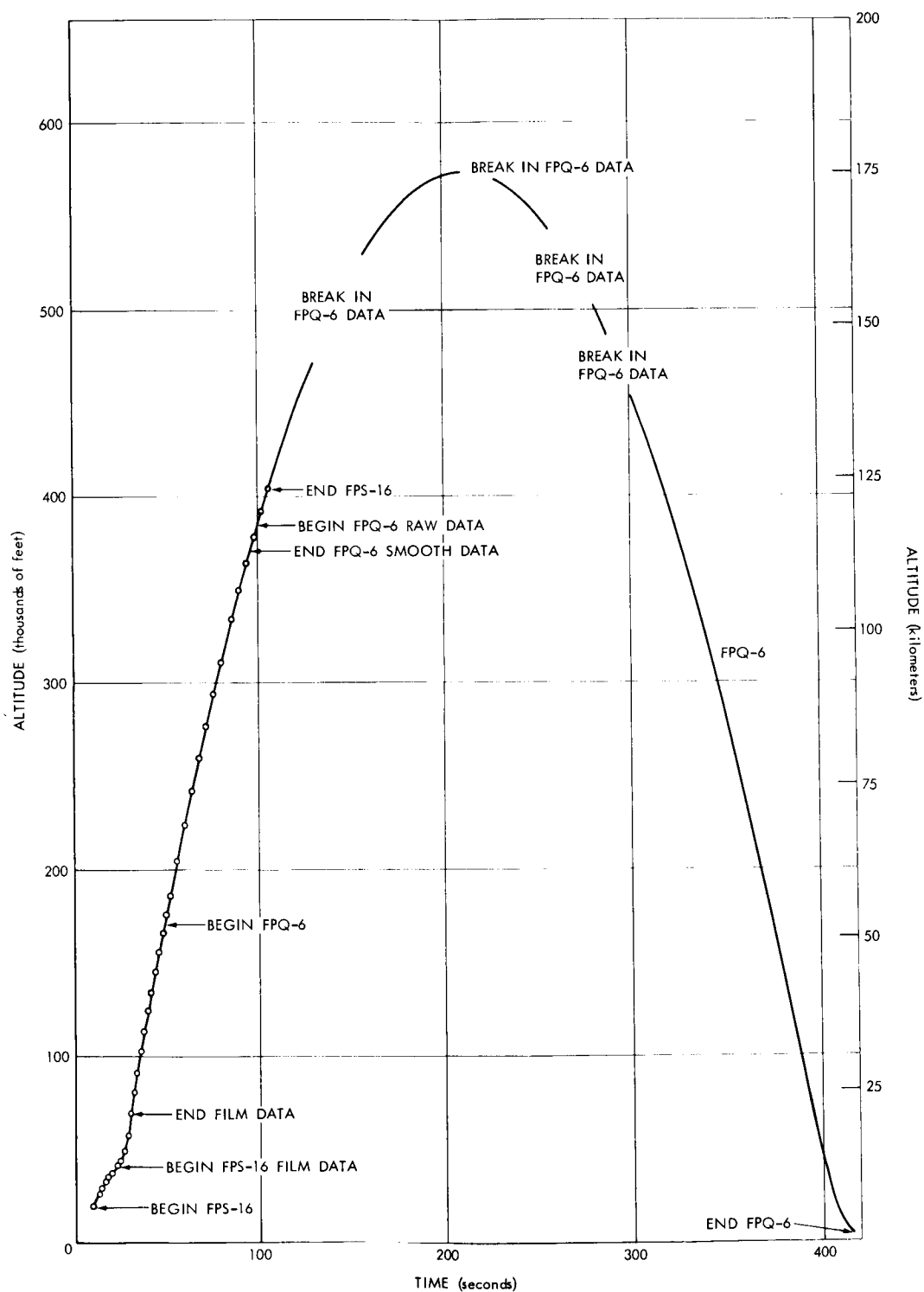


Figure 313. 14.245 UI Radar Plot, Altitude vs Time

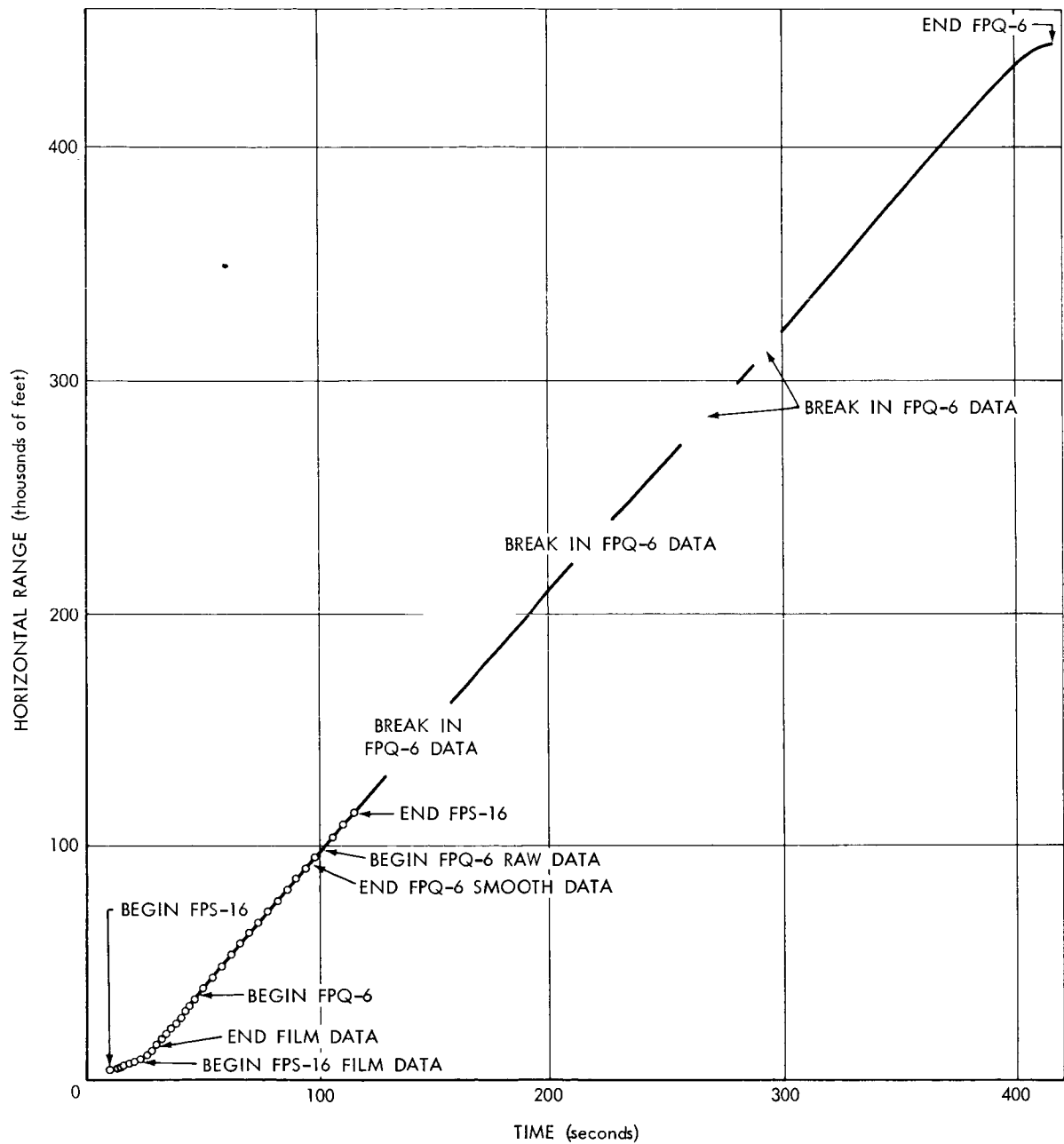


Figure 314. 14.245 UI Radar Plot, Horizontal Range vs Time

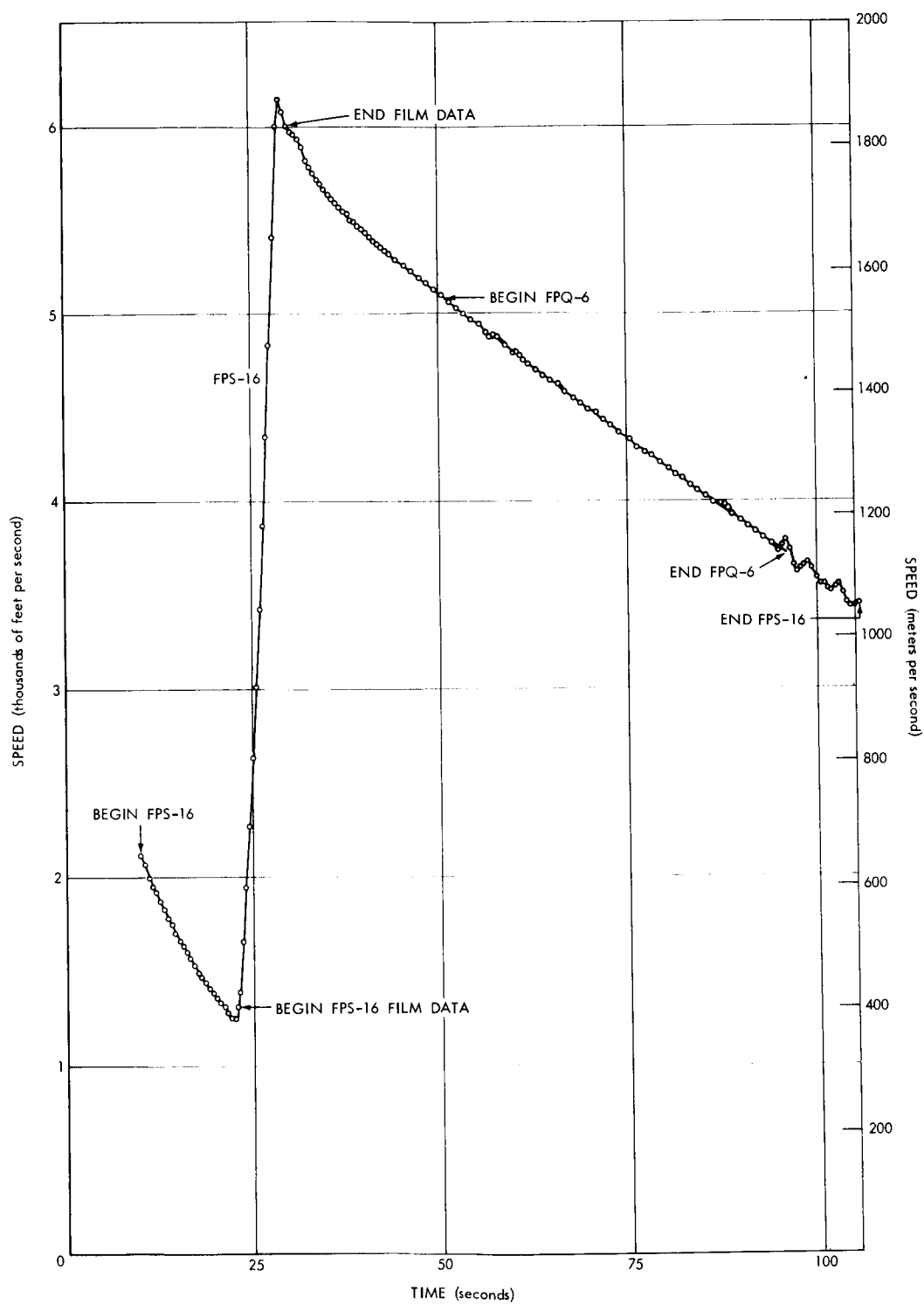


Figure 315. 14.245 UI Radar Plot, Speed vs Time

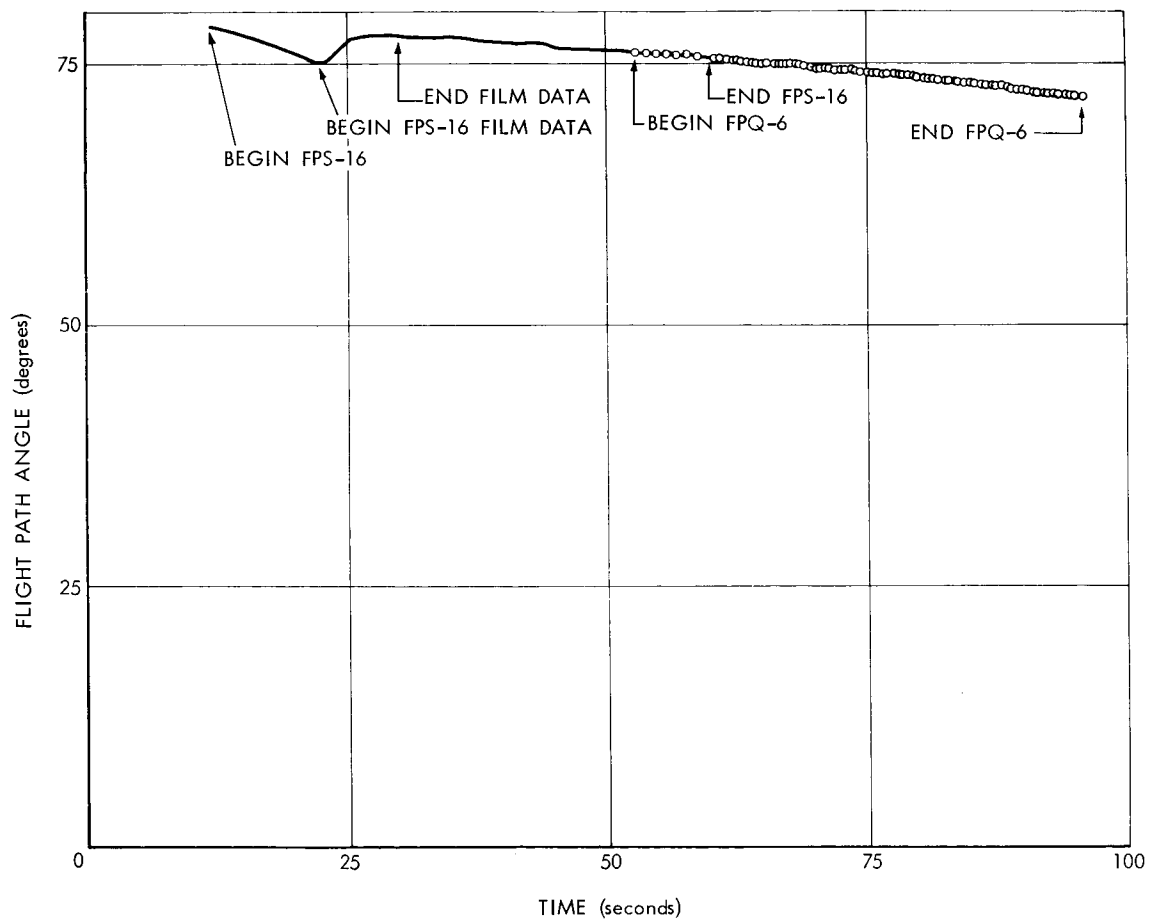


Figure 316. 14.245 UI Radar Plot, Flight Path Angle vs Time

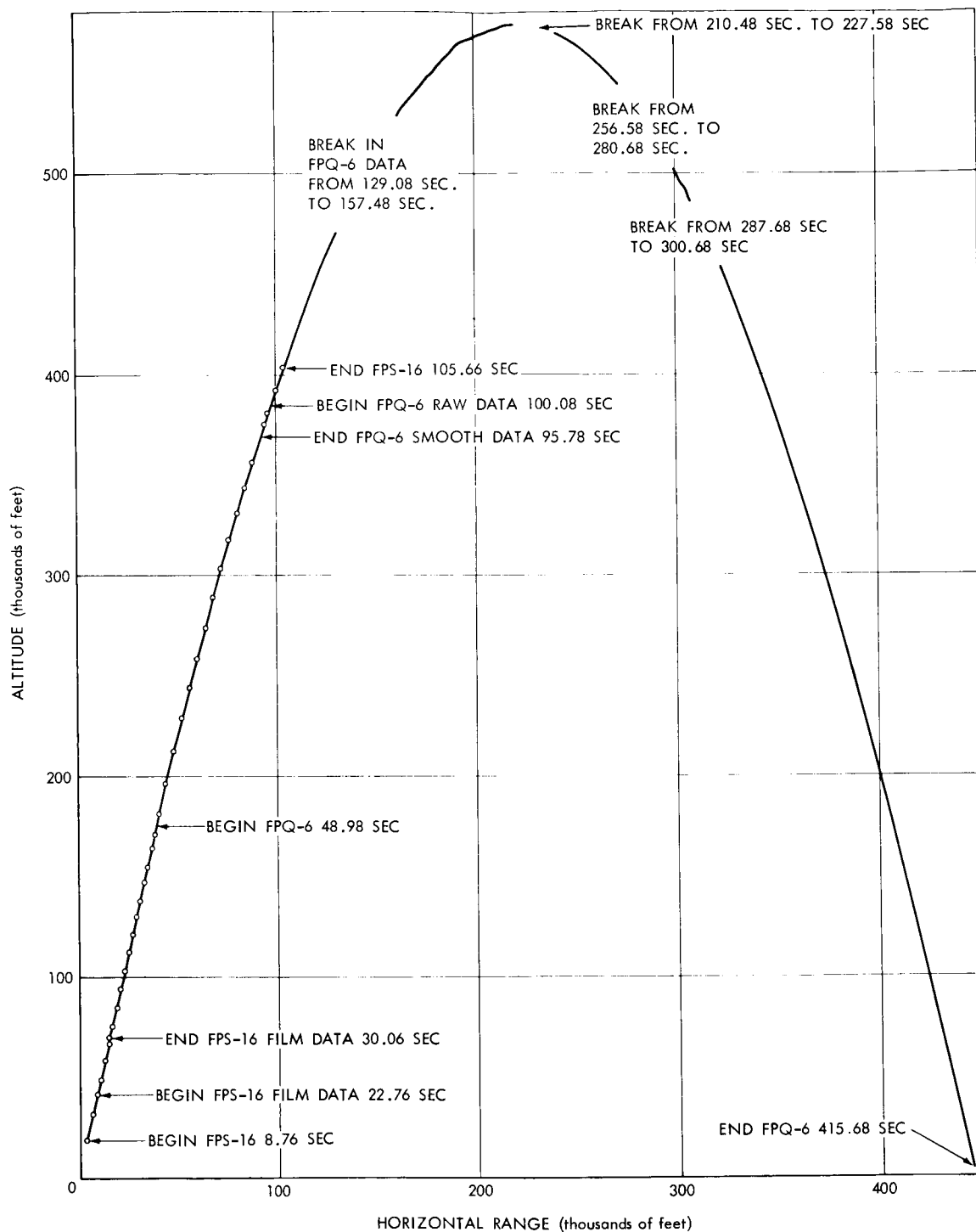


Figure 317. 14.245 UI Radar Plot, Altitude vs Horizontal Range



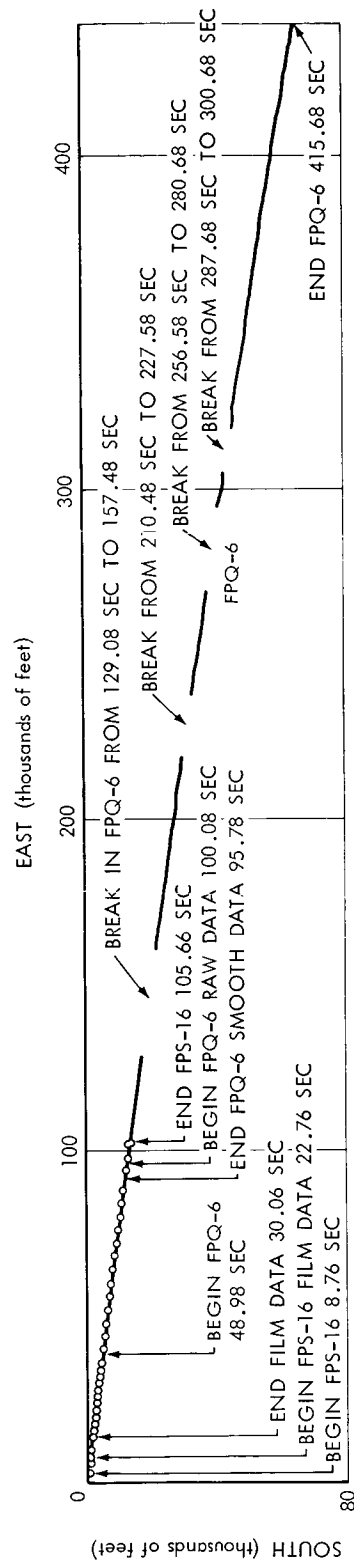


Figure 318. 14.245 UI Radar Plot, South Range vs East Range

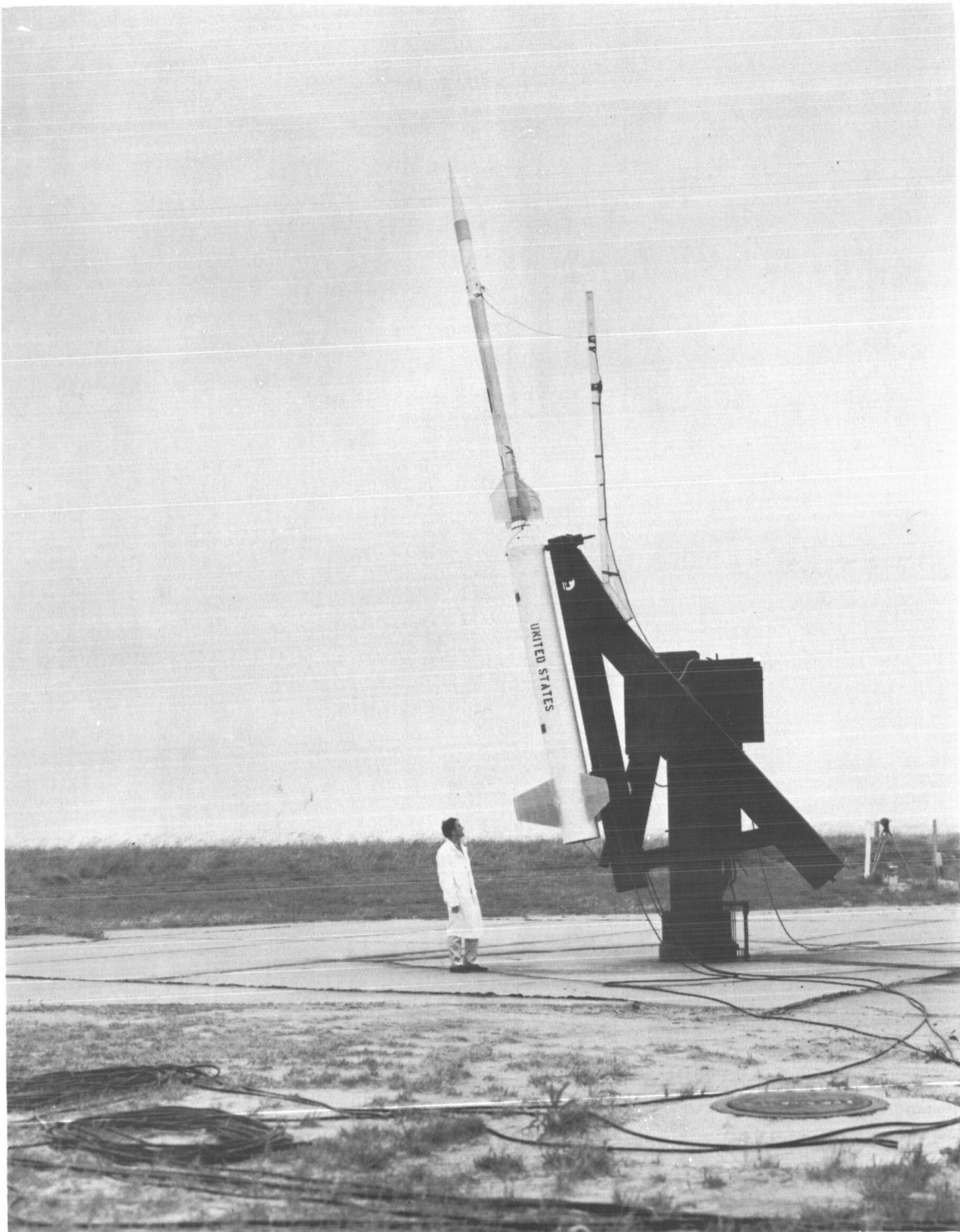


Figure 319. 14.246 UI Photograph

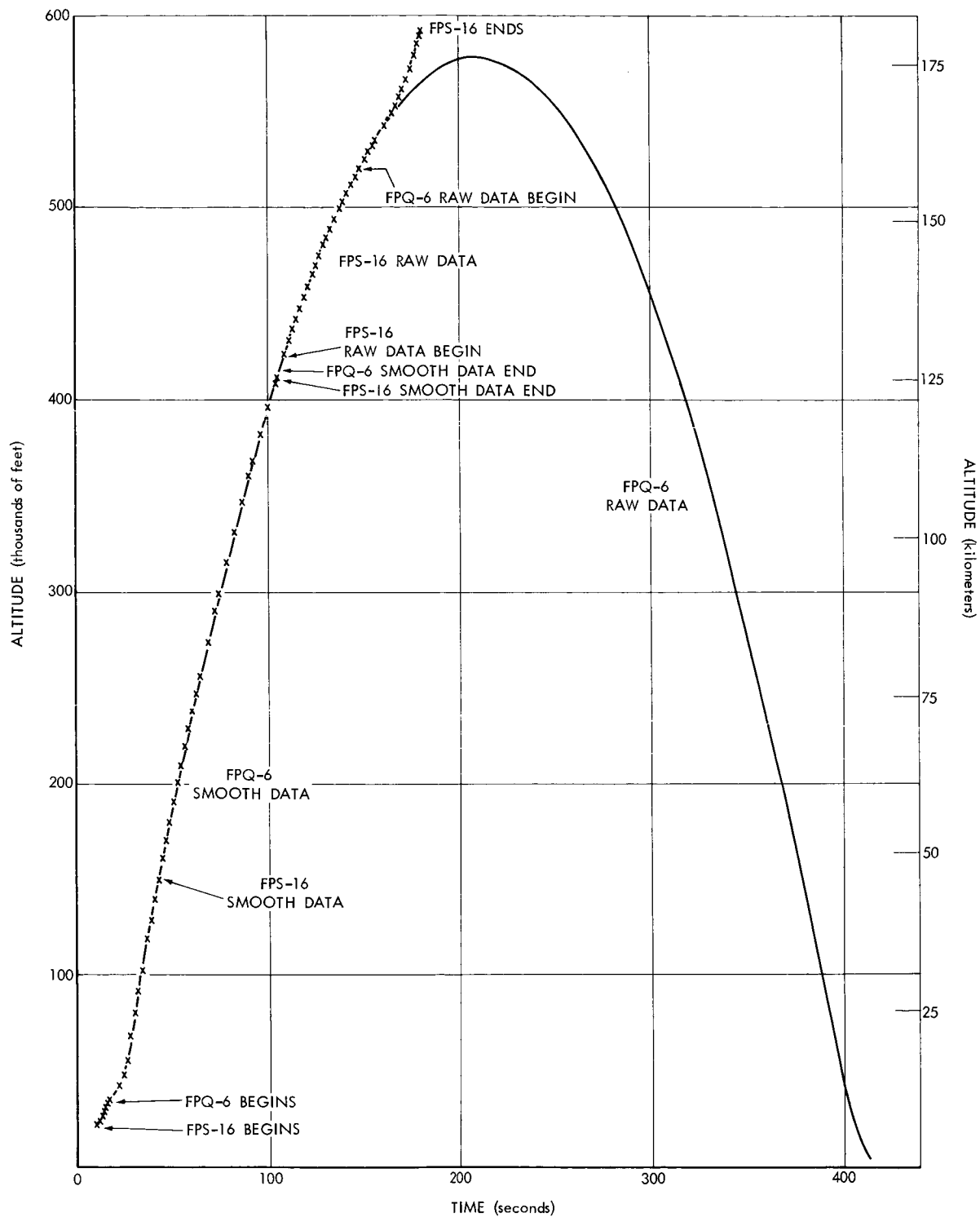


Figure 320. 14.246 UI Radar Plot, Altitude vs Time

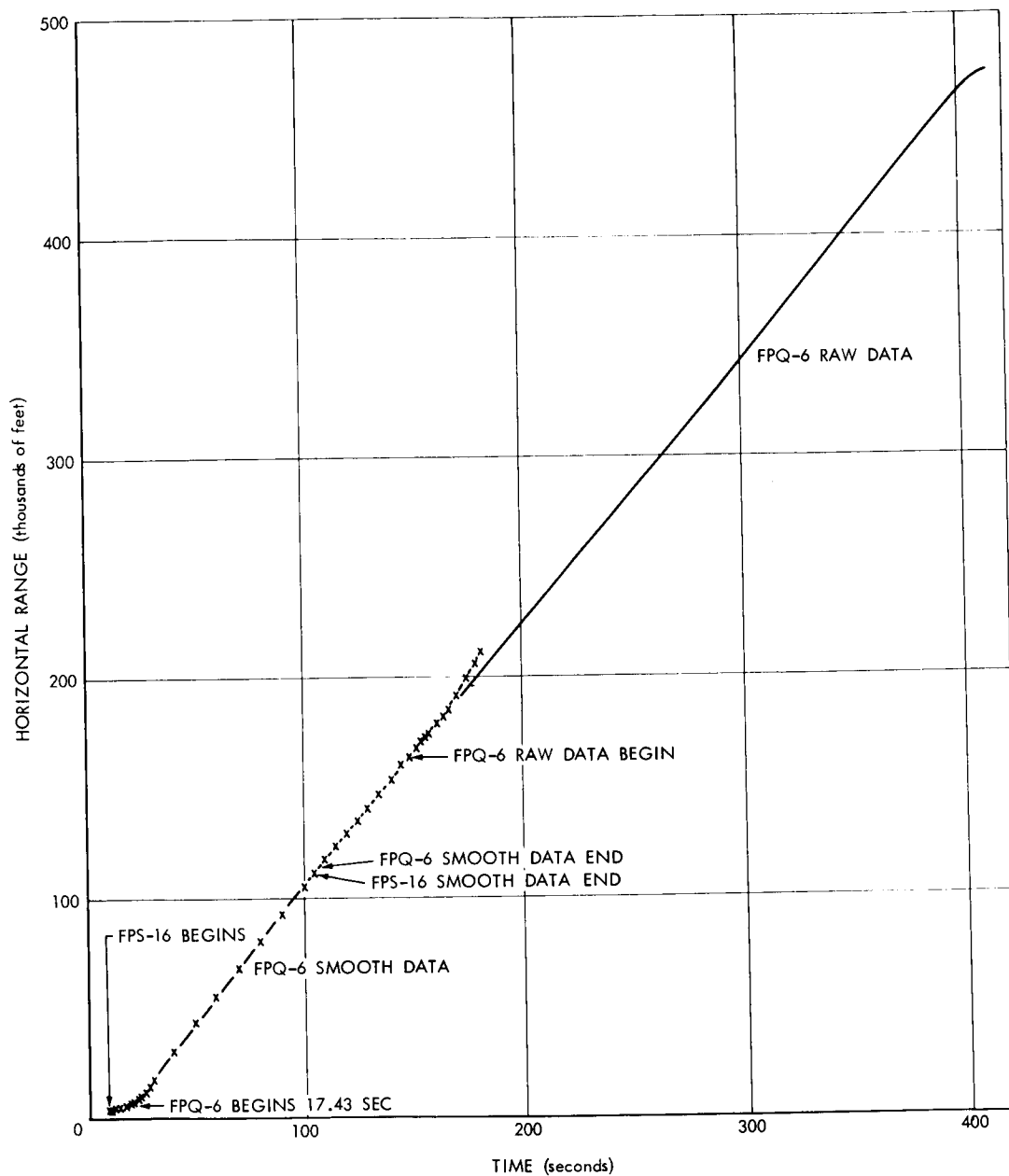


Figure 321. 14.246 UI Radar Plot, Horizontal Range vs Time

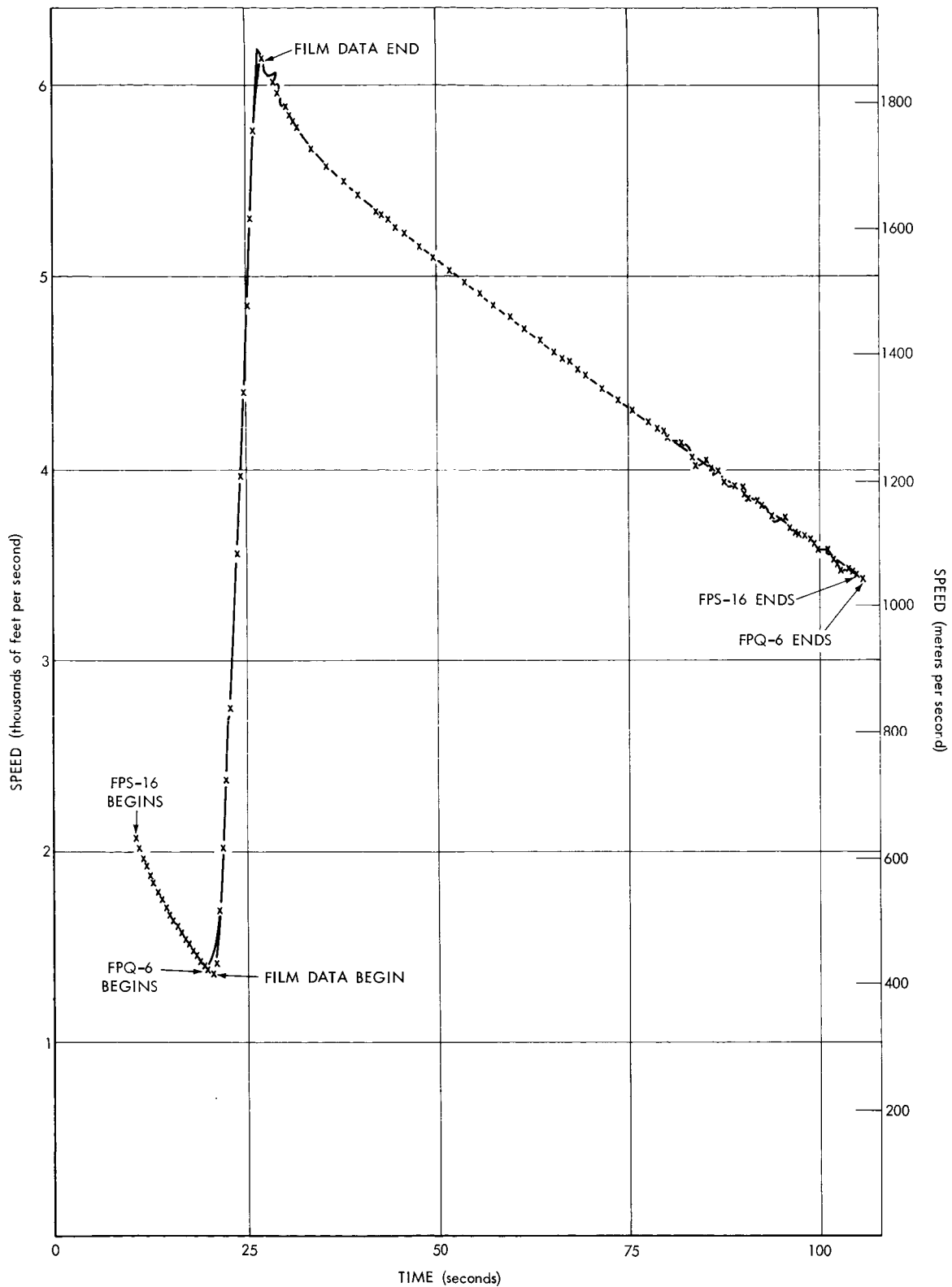


Figure 322. 14.246 UI Radar Plot, Speed vs Time

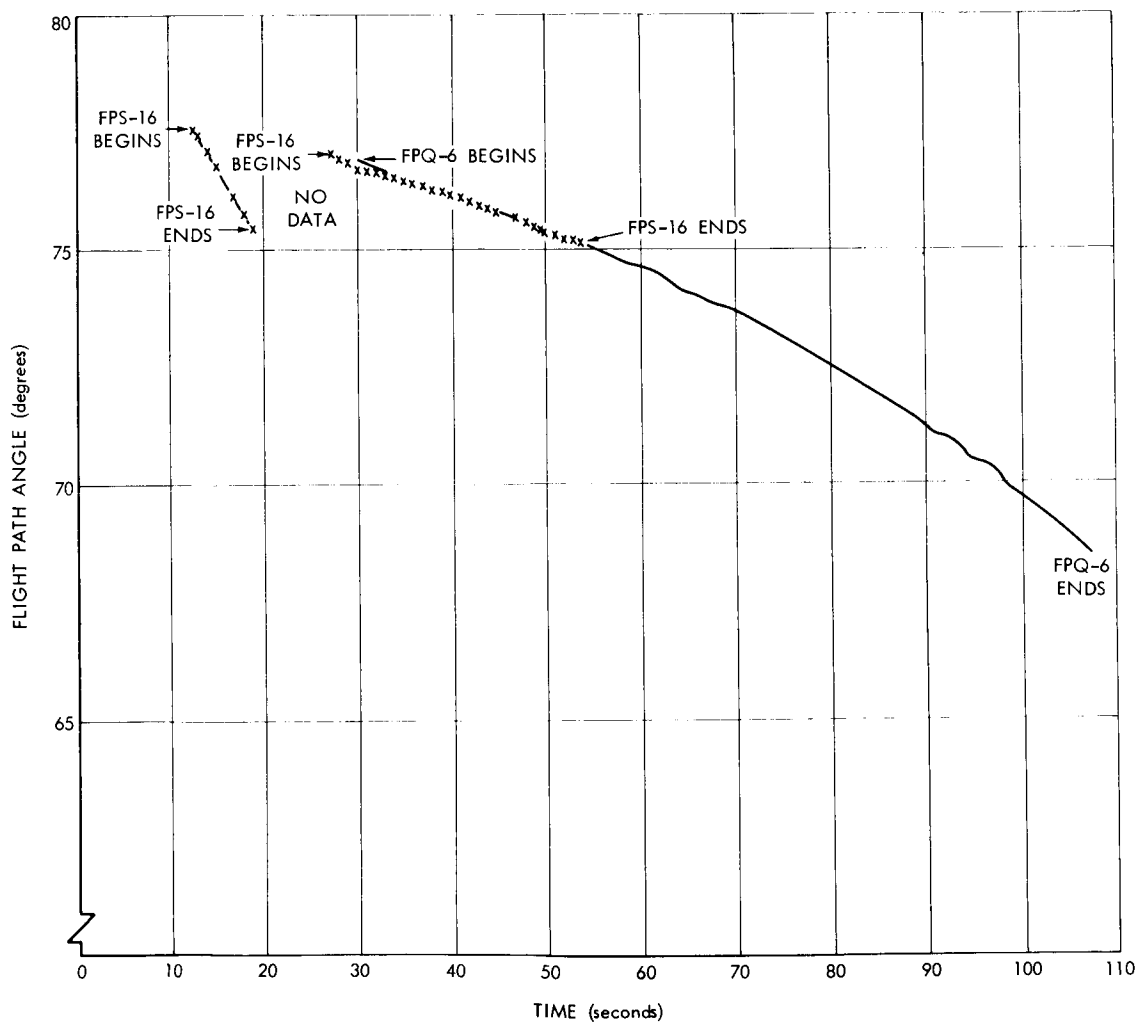


Figure 323. 14.246 UI Radar Plot, Flight Path Angle vs Time

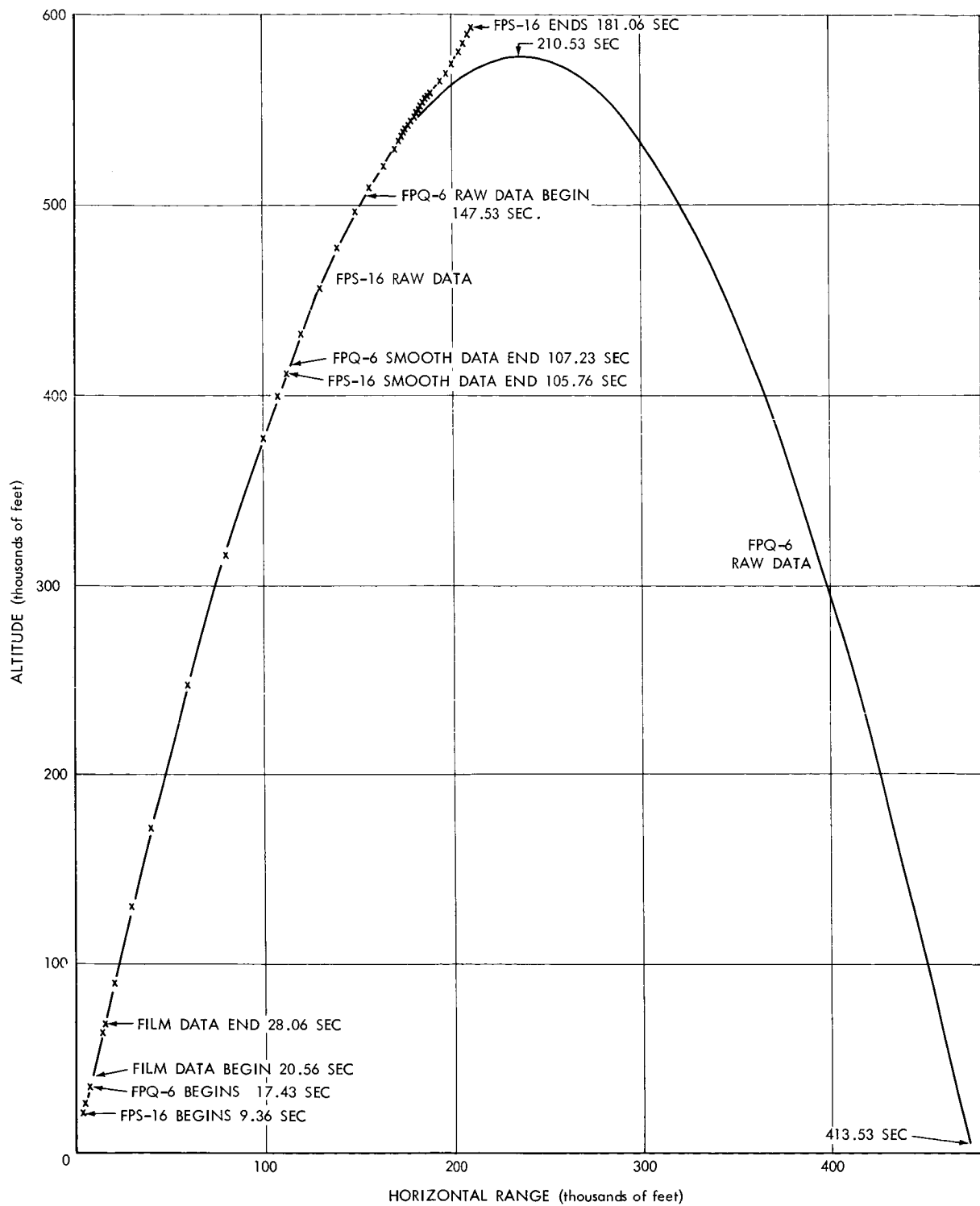


Figure 324. 14.246 UI Radar Plot, Altitude vs Horizontal Range

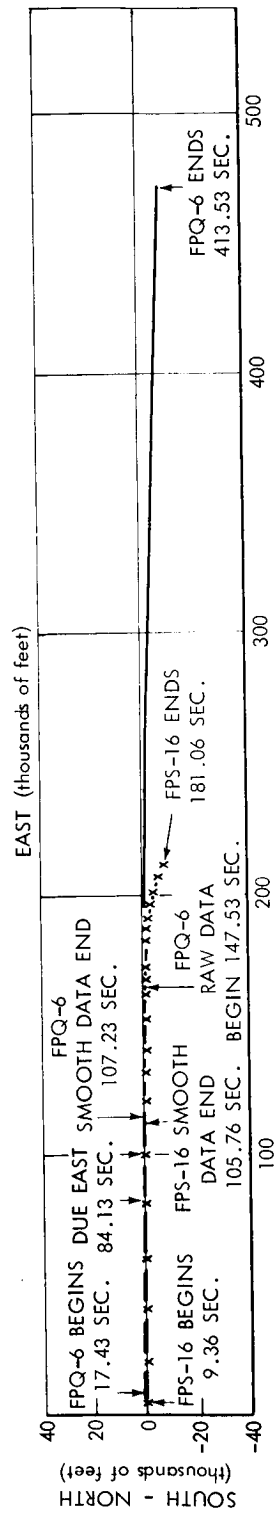


Figure 325. 14.246 UI Radar Plot, North-South Range vs East Range